Site-Specific Environmental Assessment

Rangeland Grasshopper Suppression Program

Southwest Idaho

EA Number: ID-06-02

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I. Need for Proposed Action

A. Purpose and Need Statement

The proposed action is to suppress grasshopper outbreaks on federally managed rangeland in southwest Idaho. Populations of grasshoppers occur in some areas nearly every year in southwest Idaho. The Animal and Plant Health Inspection Service (APHIS) regularly evaluates the population levels and locations of outbreak infestations. This evaluation helps to determine if site specific action is necessary to suppress outbreaks, to protect rangeland ecosystems, and to counter the potential for the grasshoppers to spread across rangelands or into surrounding crops and communities. APHIS is proposing a program to suppress outbreak populations, and is consulting with land management agencies and others in the design and implementation of the program. Specifically, APHIS is consulting with Bureau of Land Management (BLM), U.S. Forest Service (FS) and the State of Idaho. This environmental assessment (EA) analyzes potential environmental consequences of the proposed action and its alternatives. This EA applies to a proposed suppression program that would take place from May 1, 2006 to August 31, 2006 in Southwest Idaho.

Populations of grasshoppers that trigger the need for a suppression program are considered on a case-by-case basis. There is no specific grasshopper population level that triggers APHIS participation. The density of eight grasshoppers per square yard is used as the minimum population for which a suppression program would be considered. However, in many cases, populations of much greater than eight grasshoppers per yard may not justify a suppression program. In response to requests from land owners/managers, APHIS would determine if an outbreak has reached an economically or environmentally critical level. If so, an appropriate treatment plan would be developed, taking into account additional site specific information.

Participation would be based on potential destruction of crops adjacent to rangeland. Participation would also be based on benefits of treatments including protection of crops adjacent to rangelands. Some populations may not cause substantial damage to native rangeland yet may require suppression to prevent damage to high economic value crops on adjacent private land. The goal of the proposed suppression program analyzed in this EA would be to reduce grasshopper outbreak population levels in order to protect private cropland adjacent to rangeland.

This EA is prepared in accordance with the requirements under the National Environmental Policy Act of 1969 (NEPA) (42 United States Code (U.S.C.) § 4321 *et. seq.*) and the NEPA procedural requirements promulgated by the Council on Environmental Quality, United States Department of Agriculture (USDA), and APHIS. A decision will be made by APHIS based on the analysis presented in this EA and the results of public involvement and consultation with other agencies and individuals. Four

alternatives are analyzed. A selection of one of the four alternatives will be made by APHIS for the 2006 control program for Southwest Idaho.

B. Background Discussion

In rangeland ecosystems in the Western United States, grasshoppers are a normal component of the biota. Grasshoppers forage on grasses, forbs and shrubs. They recycle nutrients and occupy a valuable position in the food chain. They are native to Western rangelands and they have evolved to occupy an important niche in the ecosystem. Even though the ecosystem has been impacted by various forms of human intervention and invasion by foreign plant and animal species, and in spite of their voracious appetites, grasshoppers are usually benign with respect to human values. It is only when grasshopper populations reach outbreak levels and threaten valuable resources that control measures are required. Although millions of acres of rangeland are infested by grasshoppers every year, only a small portion of the area would normally be justified for a suppression program due to outbreak population levels.

Additionally, integrated pest management (IPM) systems may help hold grasshopper populations below economically damaging levels. Management tools which can be implemented by farmers, ranchers and land managers include:

Mechanical Control

In the earlier half of the 20th Century, mechanical flails and "hopper-dozer" collection devices were used to kill grasshoppers. These devices would not be compatible with contemporary precepts regarding destruction of rangeland plant life due to their effects on sagebrush and other shrubs.

Chemical Control

Insecticides can be effective in reducing grasshopper populations. However, in IPM systems, insecticides must be applied only when their use is warranted by potential economic loss and justified with respect to other environmental concerns.

Biological Control

Conservation of the natural predators, parasites, and pathogens sometimes help hold grasshopper populations below outbreak levels. Avoidance of unwarranted insecticide applications is a key measure in such conservation programs. Some birds and mammals are very effective predators on grasshoppers. Domestic birds including turkeys and geese have been used in some localized areas to reduce grasshopper populations.

Classical biological control is based on importing and releasing foreign biological control agents to control exotic invasive species. Classical biological control is not an option for grasshoppers, because grasshoppers are a native species.

Stakeholders have suggested that the biological insecticide *Nosema locustae* should be utilized in suppression programs in Idaho. Although some testimonials and limited research exist regarding the effectiveness of *Nosema locustae*, it is not likely to provide

effective suppression in Idaho. It does exist naturally in the overall population, but it loses much of its viability at temperatures over 70 degrees F. (Evans 1990).

Cultural Control

USDA's Agricultural Research Service and Land grant University researchers have accomplished significant research on grazing management and its impacts on grasshopper population density (Onsager 1996, Manske 1996, Onsager 2000). However, this research is primarily applicable to grasshoppers in short grass prairie ecosystems, not to grasshoppers in the rangelands of the Great Basin. Fielding and Brusven (1996) concluded that grasshopper population densities in Idaho could be decreased in the short term by increasing stocking rates of cattle two to three times the normal stocking rate. However, they also concluded that this practice would have negative long term effects including the promotion of high densities of pest grasshopper species at the expense of the more innocuous species.

In commentary on the recent grasshopper/Mormon cricket Environmental Impact Study conducted by APHIS, another federal agency suggested burning and flooding rangeland to manage grasshoppers. Private landowners have also suggested burning rangeland to eliminate grasshoppers.

Predicting Grasshopper Outbreaks and the Role of APHIS

Grasshopper populations can build up to outbreak levels despite even the best land management and other efforts to prevent outbreaks. At such a time, a rapid and effective response may be needed to reduce the destruction of rangeland vegetation and protect crops. Unfortunately, there is currently no reliable way to accurately predict the locations and severity with which outbreaks will occur.

APHIS conducts annual surveys for grasshopper populations on rangeland in Idaho. APHIS also provides ongoing technical assistance on grasshopper management to land owners and managers. APHIS works cooperatively to suppress grasshopper outbreaks on Federal land when direct intervention is requested by the Federal land management agency and APHIS determines that intervention is appropriate. Results of the 2005 Idaho grasshopper survey are available from USDA APHIS PPQ, 9134 W. Blackeagle Drive, Boise, ID 83709 or at http://www.agri.state.id.us/Categories/PlantsInsects/GrasshopperMormonCricketControlProgram/ghprogramenvirodocs_pubs_reports.php.

The need for rapid and effective suppression of grasshoppers, when an outbreak occurs, limits the options available to APHIS. The application of an insecticide within the outbreak area is the response available for APHIS to rapidly suppress or reduce (but not eradicate) grasshopper populations and effectively protect rangeland and adjacent private cropland.

In June 2002, APHIS completed an Environmental Impact Statement (EIS) document concerning suppression of grasshopper and Mormon cricket populations in 17 Western States (Rangeland Grasshopper and Mormon Cricket Suppression Program,

Environmental Impact Statement, June 21, 2002). The EIS described the actions available to APHIS to reduce the destruction caused by grasshopper and Mormon cricket populations in 17 States (Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington and Wyoming).

APHIS' authority for cooperation in this suppression program is based on Section 417 of the Plant Protection Act of 2000 (7 U.S.C. § 7717).

In May 2002, APHIS and FS signed a Memorandum of Understanding (MOU) detailing cooperative efforts between the two agencies on suppression of grasshoppers and Mormon crickets on national forest system lands, document #02-IA-11132020-106. This MOU clarifies that APHIS will prepare and issue to the public site-specific environmental documents that evaluate potential impacts associated with proposed measures to suppress economically damaging grasshopper populations. The MOU also states that these documents will be prepared under the APHIS NEPA implementing procedures with cooperation and input from FS. The MOU further states that the responsible FS official will request, in writing, the inclusion of appropriate lands in the APHIS suppression project when treatment on national forest land is necessary. The FS must also approve a Pesticide Use Proposal (Form FS-2100-2) for APHIS to treat infestations. A Pesticide Use Proposal is the tracking mechanism by which pesticide use is reported to the Environmental Protection Agency (EPA), whose role is to track use under the Federal Insecticide Fungicide and Rodenticide Act as amended (Public Law (P.L.) 92-516). Responsibility for administering the act is vested in the EPA. According to the provisions of the MOU, APHIS could begin treatments after APHIS issues an appropriate decision document and FS approves the Pesticide Use Proposal.

In February, 2003, APHIS and BLM signed a MOU detailing cooperative efforts between the two agencies on suppression of grasshoppers and Mormon crickets on BLM managed lands, APHIS PPQ MOU # 03-8100-0870-MU. This MOU clarifies that APHIS will prepare and issue to the public site-specific environmental documents that evaluate potential impacts associated with proposed measures to suppress economically damaging grasshopper populations. The MOU also states that these documents will be prepared under the APHIS NEPA implementing procedures with cooperation and input from the BLM. The MOU further states that the responsible BLM official will request, in writing, the inclusion of appropriate lands in the APHIS suppression project when treatment on BLM managed land is necessary. The BLM must also prepare a Pesticide Use Proposal for APHIS to treat infestations. According to the provisions of the MOU, APHIS could begin treatments after APHIS issues an appropriate decision document and BLM approves the Pesticide Use Proposal.

APHIS and Idaho State Department of Agriculture (ISDA) cooperate under MOU 03-8100-0403-MU to protect agricultural, horticultural and timber, and natural plant resources from losses caused by plant pests. This cooperation is conducted by APHIS by virtue of authority included in the act establishing the United States Department of Agriculture and the Plant Protection Act of June 20, 2000, (7 USC 7701-7772), which

defines plant pests, and provides the Secretary of Agriculture authority to cooperate with States or political subdivisions thereof, farmers' associations, and similar organizations, and individuals to eradicate, suppress, control, or to prevent or retard the spread of the plant pests. ISDA manages grasshopper suppression programs on state and private lands, and APHIS manages grasshopper suppression programs on federally managed lands.

C. About This Process

The EA process for grasshopper management is complicated by the fact that a decision to treat a specific outbreak area cannot be made until the need for treatment is imminent. Summer surveys help to determine general areas where grasshopper infestations may occur the following spring. There is considerable uncertainty, however, in the forecasts, so that framing absolute site specific treatment proposals for analysis under NEPA could not be effective or accurate. At the same time, the program strives to alert the public, in a timely manner, to its more concrete treatment plans and avoid or minimize harm to the environment in implementing those plans.

The 2002 EIS provides a solid, analytical and regulatory foundation; however, it may not be enough to satisfy NEPA completely for actual treatment proposals, and the "conventional" EA process will seldom, if ever, meet the program's timeframe of need. The following approach to NEPA compliance for anticipated requests to treat for grasshopper infestations will be followed:

> This EA will analyze aspects of environmental quality that could be affected by grasshopper treatment in the proposed suppression area. This EA will be made available to the public with a comment period. Following the comment period any necessary changes will be made and a Finding of No Significant Impact (FONSI) may be issued if appropriate.
>
> When the program receives a treatment request and determines that treatment is necessary, the specific treatment site within the proposed suppression area would be extensively examined to determine if environmental issues exist that were not covered in this EA. If no changes to the EA, FONSI, or APHIS' Guidelines for Treatment of Rangelands for Grasshopper and Mormon Crickets (Appendix 1) are warranted, an addendum to the EA would be prepared stating this. If changes need to be made to the EA, FONSI, or treatment guidelines, the program would prepare a supplement to the EA describing the changes and/or additional site-specific issues that were not covered in the EA. Whether an addendum or supplement is prepared, these documents would be provided to all parties who request them. Addenda and supplements would be prepared between the time that a treatment is deemed necessary and the time that treatment is applied. Addenda and supplements would be prepared in consultation with the federal land manager.

II. Scoping and input from the public

> October 17, 2005, APHIS mailed a scoping document to individuals and organizations who had indicated interest in Mormon cricket as well as

grasshopper suppression programs in past years and other stakeholders. ISDA assisted by issuing a notice of availability and posted the scoping document on their public website.

Three alternatives were proposed for comment as follows:

Alternative 1. No Action:
APHIS would not conduct insecticide treatments or any other grasshopper/Mormon cricket suppression measures.

Alternative 2.Insecticide Bait or Spray Applications to Suppress Grasshopper/Mormon cricket populations:
Upon evaluation of the population density and environmental conditions APHIS might conduct insecticide treatments with carbaryl bait, or diflubenzuron spray, or malathion spray to suppress grasshopper/Mormon cricket outbreaks. Grasshopper treatments would be limited to within one mile of agricultural cropland.

Alternative 3. Insecticide Bait or Spray Applications to Suppress grasshopper/Mormon cricket populations:
Upon evaluation of the population density and environmental conditions APHIS might conduct insecticide treatments with carbaryl bait, or diflubenzuron spray, or malathion spray to suppress grasshopper/Mormon cricket outbreaks.

Summaries of responses:

Three County Commissions in Idaho responded. Two expressed support for grasshopper and Mormon cricket suppression in general. The Board of Blaine County Commissioners expressed concerns with the protection of water quality, aquatic life, plant life, insect populations and agency compliance with the Clean Water Act. They also expressed concerns regarding cumulative impacts, drift from aerial applications and the toxicity of malathion and carbaryl spray to aquatic life. They recommended that malathion and carbaryl sprays be eliminated from consideration in the program.

One Idaho State Department responded. Idaho Department of Environmental Quality (DEQ) requested that perennial streams be avoided during application of pesticides and that the option least likely to result in pesticides entering ground or surface waters be considered.

Two formal organizations responded. The Idaho Wheat Commission indicated that Alternative 3 should be selected and implemented. Idaho Conservation League responded and expressed concerns about the protection of water quality and compliance with the Clean Water Act and

suggested that APHIS needed an NPDES permit. They expressed concerns about the protection of federally protected species and suggested a single EIS would be more appropriate under NEPA than a number of EA's addressing smaller areas. They suggested that APHIS should present an alternative that incorporates biological and behavioral controls, increase buffers to reduce drift impacts and eliminate malathion and carbaryl spray from consideration in the program. They felt alternative two would have less impact on the environment than alternative three.

Seven individuals responded. Three expressed support for alternative three and two for suppression of grasshoppers and Crickets in general. One individual stated that the use Diflubenzuron is the most effective way to control crickets and that survey and control efforts needed to begin earlier and cover a larger area to be effective. One individual offered a proposal to harvest Mormon Crickets for sale as fish bait or as a possible food source in overseas markets. The proposal suggested the crickets could be processed into a feed for poultry, commercial fish farms and for exotic animals.

APHIS has considered all the responses and has incorporated elements of the responses into this EA.

III. Alternatives

The alternatives presented in the 2002 EIS and/or considered for the proposed action in this EA are: (A) no action; (B) insecticide applications at conventional rates and complete area coverage; (C) reduced agent area treatments (RAATS); and (D) modified reduced agent area treatments (RAATS). Each of the first three alternatives, their control methods, and their potential impacts were described and analyzed in detail in the 2002 EIS. Copies of the complete 2002 EIS document are available for review at 9134 West Blackeagle Drive, Boise Idaho. It is also available at the Rangeland Grasshopper and Mormon Cricket Program web site, http://www.aphis.usda.gov/ppd/es/gh.html.

The 2002 EIS is intended to explore and explain potential environmental effects associated with grasshopper suppression programs that could occur in 17 Western States (Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, and Wyoming). The 2002 EIS outlines the importance of grasshoppers as a natural part of the rangeland ecosystem. However, grasshopper outbreaks can compete with livestock for rangeland forage and cause devastating damage to crops and rangeland ecosystems. Rather than opting for a specific proposed action from the alternatives presented, the 2002 EIS analyzes in detail the environmental impacts associated with each programmatic action alternative related to grasshopper suppression based on new information and technologies.

All insecticides used by APHIS for grasshopper suppression are used in accordance with applicable product label instructions and restrictions. Representative product specimen labels can be accessed at the Crop Data Management Systems, Inc. web site at www.cdms.net/manuf/manuf.asp. Labels for actual products used in suppression programs will vary, depending on supply issues. All insecticide treatments conducted by APHIS will be implemented in accordance with APHIS' treatment guidelines, included as Appendix 1 to this EA.

A. No Action Alternative

Under Alternative A, the no action alternative, APHIS would not fund or participate in any program to suppress grasshopper infestations. Under this alternative, APHIS may opt to provide survey information and limited technical assistance, but any suppression program would be implemented by a Federal land management agency, a State agriculture department, a local government, or a private group or individual.

B. Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative

Alternative B, insecticide applications at conventional rates and complete area coverage, is generally the approach that APHIS used for many years. Under this alternative, carbaryl, diflubenzuron (Dimilin®), or malathion would be employed. Carbaryl and malathion are insecticides that have traditionally been used by APHIS. The insect growth regulator, diflubenzuron, is also included in this alternative. Applications would cover all treatable sites within the designated treatment block per label directions. Treatments would be restricted to federally managed rangelands within one mile of private agricultural land. The application rates under this alternative are as follows:

- 16.0 fluid ounces (0.50 pound active ingredient (lb a.i.)) of carbaryl spray per acre;
- 10.0 pounds (0.50 lb a.i.) of 5 percent carbaryl bait per acre;
- 1.0 fluid ounce (0.016 lb a.i.) of diflubenzuron per acre; or
- 8.0 fluid ounces (0.62 lb a.i.) of malathion per acre.

In accordance with EPA regulations, these insecticides may be applied at lower rates than those listed above. Additionally, coverage may be reduced to less than the full area coverage, resulting in lesser effects to nontarget organisms.

The potential generalized environmental effects of the application of carbaryl, diflubenzuron, and malathion, under this alternative are discussed in detail in the 2002 EIS (Environmental Consequences of Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative, pp. 38–48). A

description of anticipated site-specific impacts from this alternative may be found in Part V of this document.

C. Reduced Agent Area Treatments (RAATs) Alternative

Alternative C, RAATs, is a recently developed grasshopper suppression method in which the rate of insecticide is reduced from conventional levels, and treated swaths are alternated with swaths that are not directly treated. The RAATs strategy relies on the effects of an insecticide to suppress grasshoppers within treated swaths while conserving grasshopper predators and parasites in swaths not directly treated. Treatments would be restricted to federally managed rangelands within one mile of private agricultural land. Either carbaryl, diflubenzuron, or malathion would be considered under this alternative at the following application rates:

- 8.0 fluid ounces (0.25 lb a.i.) of carbaryl spray per acre;
- 10.0 pounds (0.20 lb a.i.) of 2 percent carbaryl bait per acre;
- 0.75 fluid ounce (0.012 lb a.i.) of diflubenzuron per acre; or
- 4.0 fluid ounces (0.31 lb a.i.) of malathion per acre.

The area not directly treated (the untreated swath) under the RAATs approach is not standardized. In the past two years, the area that remains untreated within a treatment block has ranged from 25 to 99% percent in Idaho. The 2002 EIS analyzed the reduced pesticide application rates associated with the RAATs approach but assumed pesticide coverage on 100 percent of the area as a worst-case assumption. The reason for this is there is no way to predict how much area will actually be left untreated as a result of the specific action requiring this EA. For application to Idaho conditions in 2006, this Alternative would treat up to 50% of the land surface within a treatment block. Rather than suppress grasshopper populations to the greatest extent possible, the goal of this alternative is to suppress grasshopper populations to a desired level.

The potential environmental effects of application of carbaryl, diflubenzuron, and under this alternative are discussed in detail in the 2002 EIS (Environmental Consequences of Reduced Agent Area Treatments (RAATs), pp. 49–57). A description of anticipated site-specific impacts from this proposed treatment may be found in Part V of this document.

D. Modified Reduced Agent Area Treatments (RAATs) Alternative (Preferred Alternative)

Alternative D combines the RAATs approach explained in Alternative C with the 5% rate of carbaryl bait explained in Alternative B and eliminates the carbaryl spray component included in Alternatives B and C. Treatments would be restricted to federally managed rangelands within one mile of private

agricultural land. Either carbaryl bait or diflubenzuron spray or malathion spray would be considered under this alternative at the following application rates:

- 10.0 pounds (0.50 lb a.i.) of 5 percent carbaryl bait per acre;
- 10.0 pounds (0.20 lb a.i.) of 2 percent carbaryl bait per acre;
- 0.75 fluid ounce (0.012 lb a.i.) of diflubenzuron per acre; or
- 6.0 fluid ounces (0.465 lb a.i.) of malathion per acre.

Although 0.20 lb a.i. of carbaryl bait may be sufficient for suppression of some species of grasshoppers in some situations, heavy grasshopper populations encountered immediately adjacent to crops may require the 0.50 lb a.i. rate for adequate and timely suppression.

Aerial applications of bait or spray would be made to no more than 75% of the land area within any specific treatment block (treat three swaths and skip one swath). Thus the assessments of potential environmental impacts discussed in the 2002 EIS (5% carbaryl bait pp. 39-42; 1.0 oz diflubenzuron pp. 42-45; and 8.0 oz malathion pp. 46-48) are based on treatment rates 1.3X to 1.7X higher than the rates proposed here. Additionally, the assessments discussed in the 2002 EIS for 2% carbaryl bait (pp. 50-52) and 0.75 fluid ounce diflubenzuron (pp. 50-57) are based on treatment rates 1.3X higher than those that would actually be applied under this alternative. The malathion rate proposed here is intermediate between the two rates discussed in the 2002 EIS and would be applied at up to 75% of the coverage analyzed in the 2002 EIS.

Ground applications of bait would be made to be made to no more than 50% of the land area within any specific treatment block, and may be made to as little as <1% of the land area within any specific treatment block. Ground applications would normally be made to existing roadsides and trailsides, but might be made off roads or trails with the concurrence of land managers

IV. Methodologies

These methodologies apply to alternatives B, C and D.

A. Land Administration

As provided by the Plant Protection Act, APHIS would conduct grasshopper suppression programs on federal lands in response to requests of the administering agency. Over the past two decades, most of the suppression programs conducted by APHIS in Idaho have been on lands administered by BLM. Smaller amounts of National Forest System lands have been treated in some years. Although APHIS is authorized to treat state and private rangeland under the Plant Protection Act, the restrictions under which USDA must operate have deterred state and private land mangers from seeking cooperative programs.

Bureau of Land Management

APHIS would treat severe grasshopper outbreaks on public lands administered by the BLM in Idaho when treatments are necessary and can be effective in minimizing private and public resource impacts. APHIS would evaluate site specific complaints, develop

proposed treatment strategies consistent with the program and protection measures documented in this EA, and implement specific control or suppression actions. The grasshopper suppression program for BLM managed public lands in Idaho would be for crop protection where private lands are within close proximity to BLM managed rangeland, and where economic damage is occurring, or is expected to occur. All treatments would be designed to minimize the size of treated areas and would incorporate appropriate measures to protect resource values while maintaining treatment effectiveness. These suppression measures might be conducted either by ground or aerial applications.

Forest Service

APHIS would treat severe grasshopper outbreaks on National Forest System lands administered by FS in Idaho when treatments are necessary and can be effective in minimizing private and public resource impacts. APHIS would evaluate site specific complaints, develop proposed treatment strategies consistent with the program and protection measures documented in this EA, and implement specific control or suppression actions. The grasshopper suppression program for National Forest System lands in Idaho would be for crop protection where private lands are within close proximity of National Forest System Lands, and where economic damage is occurring, or is expected to occur. All treatments would be designed to minimize treated areas and would incorporate appropriate measures to protect resource values while maintaining treatment effectiveness. These treatment and suppression measures might be conducted either by ground or aerial applications. FS would review each proposed treatment prior to implementation.

B. Documenting Rangeland Grasshopper Suppression Programs

Requests for grasshopper suppression programs may come from federal land managers at any time. Complaints from private landowners and other persons who are threatened by grasshopper outbreaks on federal rangeland normally come when the outbreak is in progress. APHIS would document requests from federal land managers as they are received. APHIS would document complaints from private landowners and other persons with the protocol included as Appendix 4. APHIS would document evaluations, recommendations regarding treatments, and the conduct of treatments with the protocol included as Appendix 4. When APHIS would make a recommendation for a specific treatment block, it would be incumbent on the land manger to determine if the recommendation should be modified to:

Exclude sensitive areas that APHIS had included in the proposed treatment block

Include additional critical areas that APHIS had not specified

Modify the percentage of the treatment block which receives direct treatment under RAATs

The land manager would review and concur that the proposed treatment, including any modifications, was consistent with the provisions of the EA.

C. Treatment Strategy

The treatment block would consist of a parcel of rangeland infested by a grasshopper outbreak. The entire treatment block would not be treated. The surface area to which insecticides would be applied within a treatment block would range from <1% to 75% of the total block. No contiguous strip greater than 300 feet wide would ever be treated.

1. Basis for decision to treat

Grasshopper populations which are not likely to threaten crops would not be treated. Several factors are included in the threat assessments. The first level of assessment is the overall grasshopper population density. This is determined through field survey and is expressed in grasshoppers per square yard. The age composition of a grasshopper population determines how much feeding damage would be done before the end of the growing season. Although several dozen species of grasshoppers occur in Idaho, only a few are likely to cause significant damage to crops and rangeland resources. They include the long-horned Mormon cricket which is considered separately under Environmental Assessment ID- 06-01. Shorthorned grasshoppers which would be subject to treatment under this Environmental assessment include *Camnula pellucida, Aulocara elliotti, Melanoplus sanguinipes, Melanoplus bivittatus, Melanoplus packardii,* and *Oedaleonotus enigma*. No other species of grasshoppers would be expected to reach outbreak status and require suppression. The migratory status of grasshoppers determines if they would invade areas where crops need to be protected. All treatments would be within one mile of private agricultural lands.

2. Selection of treatment

Following a decision to conduct a treatment, the pesticide would be chosen according to site specific conditions. This involves many factors including type and density of vegetation, grasshopper species' acceptance of bait, terrain, climatic conditions, proximity to pollinators, life stage of the grasshopper, importance of rapid reduction of grasshopper density, need for residual control, costs, and logistics.

The decision on which insecticide (if any) to use in any situation depends on a variety of factors specific to any given site and situation. Each of the insecticides which might be selected for a treatment has characteristics that dictate its desirability for a treatment.

Diflubenzuron only kills grasshoppers or other insects when they are in their immature stages. It will not kill adult grasshoppers. It cannot be used late in the season because the grasshoppers are no longer susceptible. In a normal year, the opportunity to use diflubenzuron in Idaho can be expected to pass by about July 15 for most species of grasshoppers. Insects are not killed until seven to ten days after treatment. Diflubenzuron is reported to have a residual activity against grasshoppers lasting up to 28 days. Diflubenzuron is less harmful to other insects and must normally be ingested to be effective. Therefore, diflubenzuron does not affect adult insects, piercing sucking insects, and most nonphytophagous terrestrial insects. Diflubenzuron would be applied

as a spray with water and canola oil. It is the least costly option per acre treated. The formulation of diflubenzuron approved for use by APHIS is Dimilin 2L ®.

Carbaryl bait acts faster than diflubenzuron. It kills adult and immature grasshoppers and some other insects. It has a broader spectrum of insecticidal activity than diflubenzuron, but it also must be ingested to be lethal. It can be used effectively any time during the grasshopper season. It can be applied by air or ground. It is the most costly option. Carbaryl bait is applied in greater volume than any of the other treatments (up to 10 lbs. dry material per acre) and creates a greater logistical problem because of the amount of material which must be stored, transported and applied. Carbaryl bait can be applied by air in some situations when and where liquid insecticides cannot. Although no aerial applications of any insecticide can be conducted when wind speeds exceed 10 mph, carbaryl bait can be applied when air temperatures are too high to permit effective applications of sprays. Additionally, when terrain is too rough to allow consistently flying at the low altitude consistent with effective spray application, bait can be applied by flying at a safe altitude over the ground. Thus, the window of opportunity to apply bait is greater than for sprays. The carbaryl bait formulations approved for use by APHIS include products which impregnate carbaryl onto wheat bran, onto rolled whole wheat, and into pellets manufactured from grape and apple pumice or outdated human food products.

Malathion spray is a broad spectrum contact insecticide that is more effective in hot weather vs. cool weather. It kills adult and immature grasshoppers and many other insects. It has immediate knock-down effect and has essentially no residual activity. It is applied by air for grasshoppers on rangeland. It is intermediate in cost between carbaryl bait and diflubenzuron. It carries higher risk for non-target species vs. diflubenzuron or carbaryl bait. The formulations of malathion approved for use by APHIS are Ultra Low Volume Concentrates. They are applied without an additional carrier. Malathion would only be selected when grasshopper populations were extremely high, immediate reduction of the population was required, and options for successful use of carbaryl bait or diflubenzuron spray did not exist.

Because of their different modes of action, and suitability under different climatic conditions, the three pesticides can be sorted as follows:

Grasshopper Life stage	**Weather conditions**	**Pesticide of choice**
Nymphs	Cool and wet	Diflubenzuron or Carbaryl
Nymphs	Hot and dry	Diflubenzuron, carbaryl or Malathion
Adults	Cool and wet	Carbaryl
Adults	Hot and dry	Carbaryl or Malathion

Cost of applications (on a per acre basis) would vary with the method of application, insecticide used, size and shape of a treatment block, and distance from a support center. Aerial applications would be less expensive than ground applications. Diflubenzuron spray would be the least expensive and carbaryl bait would be the most expensive

insecticide. Larger, regular blocks would be more economical to treat than smaller, irregularly shaped blocks. Ferry and transportation costs would be greater for blocks farther from an airstrip or support base.

3. Multiple applications

No area would be treated more than once during a grasshopper season. No area which was treated for Mormon crickets during the current calendar year would be treated for grasshoppers.

4. Methods of application

Insecticides would be applied in swaths which have a width determined for each treatment device (aircraft, truck-mounted spreader, or ATV-mounted spreader). For instance, an Ayres Turbine Thrush aircraft can deliver a 100 foot swath and an ATV-mounted bait spreader can deliver up to a 40 foot swath with carbaryl bait. Swaths delivered by aircraft are parallel to one another, and swaths delivered by ground equipment are dependent on the accessibility of the terrain. Distance between swaths allows computation of the percentage of the treatment block that actually receives direct treatment.

5. Discrimination based on vegetation type

Because of concerns for conservation of insects as food for sage-obligate bird species, APHIS would decrease the amount of coverage on treatment blocks where more than 15% of the area is covered by shrub canopy. Federal land managers would determine if the area included in the block was covered with more than 15% shrub canopy and they would notify APHIS if the land was classified as grassland or shrub steppe. Additionally, APHIS would apply malathion to shrub steppe only if grasshopper populations exceeded 25 per sq. yard.

Table 1 -- Proposed treatments for 2006 Idaho grasshopper suppression

Insecticide	Treatment Area Characteristics	Proposed Treatment Blocks
Diflubenzuron spray *Applied at rate of 0.75 fluid ounce of diflubenzuron per acre (0.012 lb. a.i. per acre)* *Unless a diflubenzuron tolerance is approved for the crop, a 500 foot buffer from the crop would be observed.*	Grasslands	*Up to 1 mile strip of rangeland with up to 75% coverage.*
	Shrub Steppe	*Up to 1 mile strip of rangeland* with *up to 50% coverage.*
Carbaryl bait *Applied at rate of 10.0 pounds of 5% or 2% carbaryl bait per acre (0.50 or 0.20 lb. a.i. per acre)*	Grasslands	*Up to 1 mile strip of rangeland* with *up to 75% coverage.*
	Shrub steppe	*Up to 1 mile strip of rangeland* with up to *50% coverage.*
Malathion spray *Applied at rate of 6.0 fluid ounces of malathion per acre (0.465 lbs a.i. per acre)*	Grasslands	*Up to 1 mile strip of rangeland* with up to *75% coverage.*
	Shrub steppe	*Not used unless grasshopper population exceeds 25/sq yd. Up to 1 mile strip of rangeland* with *up to 50% coverage.*

6. additional Protective Measures Which are not Included in FY 2006 Guidelines (Appendix 1)

Appendix 1 includes protective measures which would be used in all APHIS grasshopper suppression programs, nationwide. Following are additional measures which would be implemented in Idaho.

Insecticide application rates would be reduced below EPA maximum allowable rates.

Treatment blocks would not receive full area coverage. At least 50% of each treatment block would not receive direct application of insecticide.

APHIS would provide for reasonable buffers around water. Areas which may, at some time, contain ephemeral or intermittent water would not be subject to buffering when they are dry. Buffers provided by APHIS would not necessarily prevent all insecticide from reaching water. They would prevent amounts of insecticide capable of causing

significant impact from reaching water. Aerial applications would not be made within 500 feet of water. APHIS would apply insecticides according to all Federal Insecticide Fungicide and Rodenticide Act (FIFRA) requirements. On February 1, 2005 EPA published a proposed rule to codify guidance that pesticides applied according to FIFRA are not subject to need for a National Pollution Discharge Elimination System Permit.

APHIS would perform on-site examination of proposed treatment blocks to determine the presence of water.

Biological control agent release sites would be considered on an individual basis in consultation with the land manager to determine if insecticide might be used and/or how much buffer space should be allowed.

No aerial application would be made within 0.5 mile of crops enrolled in the Idaho Certified Organic Crop Program except on the request of the organic farm manager. APHIS may decline to apply any treatments which were requested inside this buffer area. APHIS provides buffers which will prevent unwanted effects which might occur from insecticide drift. Most buffers are to prevent toxic levels of insecticide from reaching non-target sites. In the case of organic crops, any detectable level of insecticide could have the effect of causing the organic status to be revoked.

APHIS would post or continuously patrol treated areas to insure that nobody entered a treated area within the timeframe required by FIFRA for re-entry after treatment. APHIS would work with federal land managers to provide guidance if the land manager chose to post the areas beyond FIFRA requirements.

APHIS would make available a mechanism whereby individuals can request that federally managed rangelands around or adjacent to their private property would be excluded from treatments for grasshoppers. The request form is available from USDA APHIS PPQ, 9134 W. Blackeagle Drive, Boise, ID 83709.

Motor vehicle use for land-based control applications would conform to BLM field office Off Highway Vehicle designations. If non-conforming vehicle use was desired (for example, cross-country ATV travel in limited or closed areas), site specific advance permission from the authorized officer would be required.

V. Affected Environment

A. Description of Affected Environment

It is not generally possible to predict the precise locations where grasshopper outbreaks and migrations will occur in any given year. In 2005, about 310,520 acres of public and private lands were infested with heavy populations of grasshoppers in the counties covered by this EA. Because APHIS cannot be sure where migration and spread of the infestations will occur, it is necessary to include an expanded area in the EA. The proposed suppression program area specified in this EA includes areas which might host outbreaks that would require suppression. The proposed suppression area is therefore, approximately 537,451 acres before subtraction of sensitive areas including buffers around water, and other sites. APHIS estimates that no more than 10% of this area would

be included in treatment blocks and maximum area treated within a block would not exceed 75%.

Grasshopper infestations were not widespread in southwest Idaho, but locally high population levels were present in several areas in 2005. 2005 Outbreaks are depicted in the maps found in the 2005 Annual Report available from USDA APHIS PPQ, 9134 W. Blackeagle Drive, Boise, ID 83709 or at http://www.agri.state.id.us/Categories/PlantsInsects/GrasshopperMormonCricketControlProgram/ghprogramenvirodocs_pubs_reports.php.

The proposed program area included in this EA includes federally managed rangeland in Ada, Adams, Boise, Canyon, Elmore, Gem, Payette, Owyhee, and Washington Counties in Southwest Idaho described as follows:

All federally managed rangeland within:

The jurisdiction of BLM Four Rivers, Bruneau and Owhyee Field Offices, of the Boise District,
or the Boise National Forest,
or the Payette National Forest

which is within one mile of private agricultural land and lies within watersheds of the Snake River above Brownlee Dam.

Maps of the described areas are in Appendix 2. The areas by county are:

Ada	56, 079
Adams	14,425
Boise	8,997
Canyon	8,387
Elmore	150,856
Gem	28,671
Owyhee	202,419
Payette	25,211
Washington	42,406

General Description
The area lies within the Interior Columbia Basin. Landforms consist primarily of valleys and mountain ranges. Impoundments on the Snake River and its tributaries serve multipurpose use. Irrigation systems serve agricultural areas throughout the region. Except for the Snake River and its major tributaries, streams in the area are generally intermittent. Major tributaries of the Snake River that traverse proposed program areas include the Boise, Weiser, Bruneau, Owyhee, and Payette Rivers. The Owyhee, Boise, and West Mountains are the predominate mountain ranges in the area.

Treasure Valley and the Lower Payette Valley are the areas where the most intense agricultural production sites are located. Crops include row crops for food and feed and

very high value seed crops. Annual cash farm receipts in Idaho average about $ 1.8 billion from crops and 2.1 billion from livestock.

Grassland and shrubland are present across the general area. Forest lands are present at higher elevations. Grasshopper treatments would occur only in grass and shrublands, not in forests.

The plains and foothills are semi-arid sagebrush steppe. Summers are hot and winters are moderate. Average annual temperature is 40 to 55 °F. Total annual precipitation averages 5 to 20 inches; almost no rain falls during the summer months. Examples of probability of 0.50" of precipitation in a 24 hour period May 1 to August 15 (Western Regional Climate center, http://www.wrcc.dri.edu) are:

Cambridge	0 to 5%
Mountain Home	0 to 2%
Parma	0 to 3%
Caldwell	0 to 3%

The rangelands are utilized for cattle and sheep grazing. They provide habitat for native and introduced game and non-game animal species. They are in an accelerated state of ecological change due to invasion by exotic plant species, changes in fire patterns, and intervention by humans.

Elevation and topography within the overall area vary considerably, from 2,100 to near 8,000 feet, and from flat plains to steep mountain ranges. Treatments would occur on foothills and flatlands within one mile of cropland and hayfields.

BLM manages rangelands within the Boise District. FS manages rangelands within Boise and Payette National Forests.

Larger towns or cities near the federally managed rangelands include Mountain Home, Payette, Weiser, Nampa, Caldwell, Meridian and Boise. The Duck Valley Indian Reservation is in the extreme south end of the area. Deer Flat National Wildlife Refuge and Snake River Birds of Prey National Conservation Area are near the area. Idaho Army National Guard and U.S. Air Force maintain extensive training ranges in the vicinity.

Areas specifically excluded are:

> Those rangeland areas in the watersheds which drain into the Snake River downstream from Brownlee Dam. APHIS has not completed consultation with National Oceanic and Atmospheric Administration Fisheries regarding measures to protect endangered salmon and steelhead. Therefore APHIS would not include watersheds which are involved with those species.

Snake River Birds of Prey National Conservation Area including the Ted Trueblood Wildlife Area.

All Wilderness Areas.

All Wilderness Study Areas except:
Those WSAs in the Owyhee Field Office area when in accordance with the 1999 Owyhee Resource Management Plan and the Wilderness Study Area (WSA) Interim Management Policy (IMP) document H-8550-1 Interim Management Plan for Lands under Wilderness Review dated 7/5/1995.

All Areas of Critical Environmental Concern including the Sugar Valley Badlands Proposed ACEC, the Horse Hill Proposed ACEC, the Mulford's Milkvetch proposed ACEC, the proposed expansion of the Mud Flat Oolite ACEC, and the northern portion of the Bruneau River Bighorn Sheep Proposed ACEC except:

Treatment in the Long-billled Curlew Habitat ACEC would only be considered after July 15, and on a case-by-case basis. Ground treatment would be limited to existing roads and trails. No application of malathion would be permitted within the Curlew ACEC.

Treatment in the Boise Front ACEC would only be considered on a case-by-case basis. Ground treatment would be limited to existing roads and trails.

Treatment in Columbian Sharp-tailed Grouse ACEC would only be considered on a case-by-case basis. Ground treatment would be limited to existing roads and trails. No treatment would be permitted during the sharp-tailed nesting or early brood season.

Outside of the canyons in the Jump Creek Canyon ACEC and the Boulder Creek ONA/ACEC.

Aerial carbaryl bait application may be considered in the proposed Biological Soil Crusts ACEC.

Other areas which are specifically identified in this EA because of their association with sensitive species or other sensitive sites.

B. Site-Specific Considerations

1. Human Health

The suppression program would be conducted on federally managed rangelands that are not inhabited by humans. Human habitation may occur on the edges of the rangeland. Most habitation is comprised of farm or ranch houses, but some rangeland areas may have suburban developments or "ranchettes" nearby. Average population density in rural areas of Idaho is 6.3 persons per square mile. Recreationists may use the rangelands for hiking, camping, bird watching, hunting, falconry or other uses.

Individuals with allergic or hypersensitive reactions to insecticides may live near or may utilize rangelands in the proposed suppression program area.

Some rural schools may be located in areas near rangeland which could be subject to treatment.

2. Non-target Species

Non-target species within the suppression program area include terrestrial vertebrate and invertebrate animals, aquatic organisms, and terrestrial plants (both native and introduced).

Invertebrate organisms of special interest include biocontrol agents and pollinators. Land managers and others have released and managed biocontrol agents including insects and pathogens on many species of invasive plants within and near the suppression program area. These biocontrol agents are important in decreasing the overall population or the rate of reproduction of some species of undesirable rangeland plants, especially exotic invasive weeds.

Pollinators including insects and other organisms occur within and near the suppression program area. Pollinators include managed exotic and native insect species such as honey bees, leafcutter bees, and alkali bees which are commercially valuable for agriculture. Other species of insects and other animals pollinate native and exotic plants and are necessary for the survival of some species.

Vertebrates include highly visible introduced and native mammalian species such as cattle, sheep, horses, mule deer, elk, pronghorn, coyotes and wolves as well as smaller animals like rabbits, mice, gophers and bats. Birds comprise a large portion of the vertebrate species complex, and they also include exotic and native species. Some exotic game birds, like pheasant and partridge, have been deliberately introduced into the area, and other species such as starlings and pigeons have spread from other loci of introduction. Sage obligate bird species, typified by sage grouse, are present in some of the area. Various reptiles and amphibians are also present. Many of the herbivorous vertebrate species compete with grasshoppers for forage. Many of the vertebrate species utilize grasshoppers and other insects as a food source. There is special concern about the role of grasshoppers as a food source for sage grouse, sharp-tailed grouse, and other bird species.

The proposed suppression area contains a vast variety of terrestrial invertebrates, primarily insects and other arthropods. They include species which compete with grasshoppers and some which prey on grasshoppers.

Aquatic organisms within the suppression area include plants and vertebrate and invertebrate animals. Some species of fish utilize grasshoppers as a significant food source during some parts of the year.

A diverse complement of terrestrial plants occurs within the proposed suppression area. Many such as rush skeletonweed, purple loosestrife, spotted and diffuse knapweed,

downey brome, and leafy spurge are invasive weeds. Native plants such as sagebrushes, bitterbrush, and various grasses provide forage and shelter for animal species and help stabilize the soil against erosion.

Biological soil crusts, also known as cryptogamic, microbiotic, cryptobiotic, and microphytic crusts, occur within the proposed suppression area. Biological soil crusts are formed by living organisms and their by-products, creating a crust of soil particles bound together by organic materials. Crusts are predominantly composed of cyanobacteria (formerly blue-green algae), green and brown algae, mosses, and lichens. Liverworts, fungi, and bacteria can also be important components. Crusts contribute to a number of functions in the environment. Because they are concentrated in the top one to four mm of soil, they primarily affect processes that occur at the land surface or soil-air interface. These include soil stability and erosion, atmospheric N-fixation, nutrient contributions to plants, soil-plant-water relations, infiltration, seedling germination, and plant growth.

Federally listed threatened and endangered species which might occur in or near the proposed suppression area include:

Gray wolf (Ada, Adams, Boise, Canyon, Elmore, Gem, Owyhee, Payette, Washington),

Canada lynx (Adams, Boise, Elmore),

Bald eagle (Ada, Adams, Boise, Canyon, Elmore, Gem, Owyhee, Payette, Washington),

Bliss Rapids snail (Elmore, Owyhee),

Snake River physa (Elmore, Owyhee),

Idaho springsnail (Elmore, Owyhee, Payette, Washington, Canyon),

Bruneau hot springsnail (Owyhee),

Bull trout (Ada, Adams, Boise, Elmore, Gem, Owyhee, Payette, Washington), and

Northern Idaho ground squirrel (Adams, Washington)

Areas where proposed critical habitat for bull trout may be within or near the proposed suppression area include parts of Adams, and Owyhee Counties.

Slickspot peppergrass was proposed for federal endangered species status in Ada, Boise, Elmore, Gem, Owyhee, and Payette counties. The proposal was withdrawn January 22, 2004, and a Candidate Conservation Management Agreement has been developed. On August 19, 2005, a court order granted summary judgment reversing the withdrawal.

Discussion of these species is included in VI.B.7
Many other species are accorded special status by federal land managers or by the State of Idaho. Data about these species are available from the respective land managers or at http://www2.state.id.us//fishgame/info/cdc/cdc.htm.

3. Socioeconomic Issues

Local economies in the areas nearest most proposed suppression areas are driven primarily by agricultural production, processing, and marketing concerns. In the general area manufacturing and high tech industries and major service providers maintain plants and headquarters. Major employers in southwestern Idaho include: J.R. Simplot Co., Wal-Mart, Idaho State Government, US Government, Micron Industries, and Hewlett Packard.

Livestock enterprises include rangeland grazing by cattle and sheep, feedlots for beef, and concentrated dairy operations. Local processing which adds value to livestock production systems includes meat packing houses, and cheese plants.

Crop growers in areas near proposed suppression areas grow feed for the dairies and feedlots. This includes alfalfa and corn. They also grow potatoes, sugarbeets, wheat, barley, sweet corn, beans, apples, plums, cherries, and a variety of other crops. High value seed crops are a major element in the agricultural economy. Seed and sugarbeet processing plants add value in several of the rural communities.

Acreage in organic production has decreased in the area near proposed suppression areas. There were 50,800 acres registered in organic production in Idaho in 2003. This includes feed for organic dairies and various other organic crops.

Beekeepers maintain hives to produce honey and other bee products on land which is included in the proposed treatment area as well as on land located near the proposed treatment area. Seed crops and fruit crops rely on pollination from bees which may live or forage on or near proposed suppression areas.

The general public uses federally managed rangelands in the proposed suppression area for a variety of legitimate recreational purposes including hiking; camping; wildlife and bird watching; insect, plant and rock collecting; hunting; falconry; and target shooting. Members of the general public traverse rangelands in or near the proposed suppression area on foot, horseback and other beasts of burden, all terrain vehicles, bicycles, motorcycles, four-wheel drive vehicles, snowmobiles, aircraft, and balloons.

Artificial surfaces in or near the proposed suppression area include the walls and roofs of buildings, painted finishes on automobiles, trailers, recreational vehicles, and road signs. See 2002 EIS, pp 71-72.

Esthetic values of the natural environment in the suppression area include the views, vistas, diversity of the biota, and the opportunity to commune with nature in isolated

settings. Many stakeholders have expressed extremely strong opinions regarding the esthetics of the natural environment.

4. Cultural Resources and Events

Cultural and historical sites include locations and artifacts associated with Native Americans, explorers, pioneers, religious groups and developers. Native American petroglyphs may occur near the proposed suppression area. Artifacts from knapping may occur within the proposed suppression area. Elements of the Oregon and California Trails transect portions of the proposed suppression area, and monuments have been erected in several places. Museums, displays and structures associated with mining, logging, and irrigation development exist in areas near the proposed suppression area. Adverse effects to cultural resources could include: destruction; damage; alteration; removal; change of use; alterations to the setting; and introduction of intrusive elements. APHIS would conduct control activities so as to avoid adverse effects to cultural resources by avoiding work in areas that are obviously historically/culturally sensitive; and not driving vehicles through historic ruins.

5. Special Considerations for Certain Populations

a. Executive Order No. 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order (E.O.) 12898, Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations, was signed by President Clinton on February 11, 1994 (59 *Federal Register* (FR) 7269). This E.O. requires each Federal agency to make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. Consistent with this E.O., APHIS would consider the potential for disproportionately high and adverse human health or environmental effects on minority populations and low-income populations for any of its actions related to grasshopper suppression programs.

Population makeup in Idaho (U.S. Census Bureau 2000) is 90.9% White. Hispanic or Latino of any race is the next most numerous group comprising 7.8 %. Other identifiable groups include Black or African American 0.4%, American Indian and Alaska Native 1.4 %, Asian 1.0%, and Native Hawaiian and Other Pacific Islander 0.1%. The proposed suppression area is relatively reflective of the overall state population breakdown. Of the minority groups, Hispanic and Asian appear to be the groups with most involvement in agriculture. Hispanic workers are often engaged in production and processing of crops. Sheepherding is a profession which currently engages persons of Peruvian nationality or Basque descent. Persons of Asian descent are frequently involved in crop production and processing.

County	2003 population estimate	percent minority population
Ada	325,151	7.1%
Adams	3515	3.7%
Boise	7,236	4.8%
Canyon	151,508	16.9%
Elmore	28,872	14.6%
Gem	15,795	6.2%
Owyhee	11,186	23.1%
Payette	21,466	9.7%
Washington	9,995	12.4%

Figures for Idaho put 8.3% of the families and 11.8% of the individuals in the state below the poverty level in 1999. Median family income was $44,022 and per capita income was $17,336 in 2000. The proposed suppression area is relatively reflective of the overall state income breakdown.

County	2003 population estimate	percentage below poverty 1999
Ada	325,151	7.7%
Adams	3515	15.1%
Boise	7,236	12.9%
Canyon	151,508	12.0%
Elmore	28,872	11.2%
Gem	15,795	13.1%
Owyhee	11,186	16.9%
Washington	9,995	13.3%

b. Executive Order No. 13045, Protection of Children from Environmental Health Risks and Safety Risks

The increased scientific knowledge about the environmental health risks and safety risks associated with hazardous substance exposures to children and recognition of these issues in Congress and Federal agencies brought about legislation and other requirements to protect the health and safety of children. On April 21, 1997, President Clinton signed E.O. 13045, Protection of Children From Environmental Health Risks and Safety Risks (62 FR 19885). This E.O. requires each Federal agency, consistent with its mission, to identify and assess environmental health risks and safety risks that may disproportionately affect children and to ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.

Individuals under 18 years of age comprise 30.6% of the population in Idaho. There is no reason to believe that the population age structure near the proposed treatment areas is different than the surrounding area.

County	2003 Population estimate	Percentage Under Age 18 (2000 census)
Ada	325,151	27.3%
Adams	3515	23.9%
Boise	7,236	26.9%
Canyon	151,508	30.9%
Elmore	28,872	28.0%
Gem	15,795	28.0%
Owyhee	11,186	31.9%
Payette	21,466	30.6%
Washington	9,995	27.4%

VI. Environmental Consequences

Each alternative described in this EA potentially has adverse environmental effects. The general environmental impacts of carbaryl, diflubenzuron and malathion applied to rangeland for grasshopper and Mormon cricket suppression are discussed in detail in the 2002 EIS. The specific impacts of the alternatives are highly dependent upon the particular action and location of infestation. The principal concerns associated with the alternatives that include insecticide application are: (1) potential damage to crops and natural resources by grasshopper outbreaks, (2) the potential effects of the pesticides on human health (including subpopulations that might be at increased risk); and (3) impacts of pesticides on non-target organisms (including threatened and endangered species).

Risk analysis for human health is discussed in the 2002 EIS, pp B1-B6. Non-target species risk analysis is discussed in the 2002 EIS, pp B6- B10.

The potential generalized environmental effects of the application of carbaryl to rangeland for grasshopper and Mormon cricket suppression are discussed in detail in the EIS, pp 38-42, 50-52, B10-B13, B22-B25, B29-B31, B36-B39, B46-B48, B52-B53, B56-B57, B60, C11-C13.

The potential generalized environmental effects of the application of diflubenzuron to rangeland for grasshopper and Mormon cricket suppression are discussed in detail in the EIS, pp 42-45, 52-55, B14-B16, B25-B27, B31-B32, B39-B42, B48-B49, B53, B57, B60-B61, C13.

The potential generalized environmental effects of the application of malathion to rangeland for grasshopper and Mormon cricket suppression are discussed in detail in the EIS, pp 46-48, 55-57, B16-B21, B27-B29, B33-B35, B42-B45, B49-B51, B54-B55, B58-B59, B61-B62, C14-C15.

A. Environmental Consequences of the Alternatives

Site-specific environmental consequences of the alternatives are discussed in this section.

1. No Action Alternative

Under this alternative, APHIS would not fund or participate in any program to suppress grasshoppers on federally managed rangeland. If APHIS does not participate in any grasshopper suppression program, Federal land management agencies, State agriculture departments, local governments, or private groups or individuals, may not be able to effectively control outbreaks in a coordinated effort. In these situations, grasshopper outbreaks could develop and spread unimpeded. See 2002 EIS, pp 29-30 for general consequences.

Human health

Very dense bands of grasshoppers can make roadways slick. It is not known whether any traffic accidents have been directly attributable to this phenomenon in Idaho. Highway 55 was made slick by migrating *Camnula pellucida* in Valley County in 2000. There is some risk of personal injury or death due to automobile accidents caused by grasshoppers on highways and roads.

Persons who are entomophilic may have reduced levels of concern and increased enjoyment from experiencing the outbreaks for recreational or scientific purposes. Persons who are entomophobic may have increased levels of concern about insect abundance.

Some stakeholders have indicated that they are opposed to any treatments on public rangelands because they believe treatments would disrupt ecosystems, create human health problems or give unfair economic advantage to agricultural interests. The anxiety levels of these stakeholders may be reduced if APHIS does not suppress grasshopper outbreaks. Some stakeholders have indicated they would suffer financial loss if grasshopper suppression programs are not conducted. The anxiety levels of these stakeholders might be increased.

If APHIS does not treat grasshopper outbreaks on rangeland, there is an increased probability of additional insecticidal treatments on crops which would be invaded by grasshoppers. This would result in increased exposure of farm workers, including members of minority populations, to insecticides with higher toxicity than carbaryl.

Non-target species

An abundant supply of grasshoppers and other insects would be available as a food source for insectivorous animals. This includes birds and other animals which have been accorded sensitive species status by land managers and others.

Under this alternative, non-target species on federally managed rangeland would not be exposed to insecticides unless they were applied by other parties. Land managers would probably consider such action a trespass violation. APHIS cannot predict the probability of such action nor speculate which insecticides and insecticide rates might be applied. Grasshoppers in unsuppressed outbreaks would consume agricultural and nonagricultural plants. The damage caused by grasshopper outbreaks could also pose a risk to rare,

threatened, or endangered plants that often have a low number of individuals and limited distribution. Plants can be killed or weakened by grasshopper feeding.

Loss of plant cover would occur due to consumption by grasshoppers. Nesting and cover habitat may be degraded for birds and other wildlife. The herbaceous understory is important to nesting success by sage grouse (Connelly, et. al. 1994).

Rangeland which has been overgrazed by grasshoppers is more susceptible to invasion by nonnative plant species. Plant cover may protect the soil from the drying effects of the sun. The plant root systems which hold the soil in place may be weakened, leading to increased rates of erosion.

If APHIS does not participate in any grasshopper suppression programs, local governments, or private groups or individuals may attempt to conduct widespread grasshopper programs. Without the technical assistance and program coordination that APHIS can provide to grasshopper programs, it is possible that a large amount of insecticides, including those APHIS considers too environmentally harsh, could be applied, reapplied, and perhaps misapplied in an effort to suppress or even locally eradicate grasshopper populations. It is not possible to accurately predict the environmental consequences of the No Action alternative because the type and amount of insecticides that could be used in this scenario are unknown. However, APHIS is aware that in 2002 and 2003 other public and private parties applied furadan, malathion, diflubenzuron, carbaryl, and dimethoate for grasshopper control on private land in Idaho.

Rangeland fires may be set by persons who desire suppression of the grasshoppers. Action of this type has not been documented, but individuals have threatened to set fires to destroy grasshopper outbreaks that are not controlled.

Socioeconomic issues

There is a risk that grasshopper outbreaks on rangeland would decrease the availability of forage for cattle and sheep. If sheep and cattle grazing become unprofitable, there may be disproportionate impact on the sheepherding and cattle raising professions. Sheepherders often belong to minority population groups.

Unchecked movement of grasshopper outbreaks into crops would result in crop loss and additional expenditures for insecticidal control in the crop fields. Organic farmers may suffer significant losses if grasshopper outbreaks are not controlled on rangeland and emigrate to organic cropland.

Stakeholders have suggested that the federal government should compensate farmers for losses incurred when grasshoppers emigrate from public rangeland into crops. USDA Risk Management Agency currently offers multiperil crop insurance which may compensate for losses due to insects when the policy holder utilizes appropriate pest control measures, and those measures fail. Normally, payment of such claims is on the basis of failure of pest control spray practices due to untimely rainfall or some other natural event. USDA Farm Service Agency may be able to offer low interest loans when

disasters are declared for various reasons which can include grasshopper outbreaks. Skold and Davis (1995) proposed a rangeland grasshopper insurance program. No authority currently exists for such a program.

Cultural resources and events
Grasshoppers were a significant source of protein for indigenous North American people. They are no longer used in this country as a human food source except as a novelty or recreational experience. They are used for fish bait and for pet food. Selection of the No Action alternative would result in their abundant availability for these purposes.

Grasshopper populations at outbreak levels on rangeland would decrease the recreational satisfaction of some people utilizing rangeland resources, primarily those who do not like insects. Grasshopper populations at outbreak levels on rangeland would increase the recreational satisfaction of some people utilizing rangeland resources.

Artificial Surfaces
Grasshoppers have been reported as recently as 2002 (in Nebraska) to have eaten the paint off houses. There is a possibility that artificial surfaces might suffer some damage due to chewing by grasshoppers.

2. Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative

Under Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative, APHIS would participate in grasshopper programs with the option of using one of the insecticides carbaryl, diflubenzuron, or malathion, depending upon the various factors related to the grasshopper outbreak and the site-specific characteristics. The use of an insecticide would occur at the conventional rates:

- 16.0 fluid ounces (0.50 pound active ingredient (lb a.i.)) of carbaryl spray per acre;
- 10.0 pounds (0.50 lb a.i.) of 5 percent carbaryl bait per acre;
- 1.0 fluid ounce (0.016 lb a.i.) of diflubenzuron per acre; or
- 8.0 fluid ounces (0.62 lb a.i.) of malathion per acre.

APHIS would not apply more than a single treatment in an outbreak year to affected rangeland areas in an attempt to suppress grasshoppers.

General
The implementation of pesticide label instructions, restrictions and the APHIS treatment guidelines (Appendix 1), and additional protective measures specified within this EA would reduce potential impacts from the program use of insecticides.

Human health
Human exposure to insecticides would occur. Exposures and effects are discussed in the 2002 EIS pp. 39-40, 50, B10-B13, B22-B25, B51-B53. Potential exposures of the

general public to insecticides are infrequent and of low magnitude under this alternative. These low exposures to the public pose no risk of direct toxicity, carcinogenicity, neurotoxicity, genotoxicity, reproductive toxicity, or developmental toxicity. Public exposure would be highest under this alternative because more insecticide would be expected to be used.

Personnel working on the suppression program would be exposed during handling, loading and application of the insecticides. Implementation of the Treatment Guidelines (Appendix 1.) would minimize public exposure and protect workers from harmful exposure. The potential for adverse effects to workers is negligible if proper safety procedures are followed, including wearing the required protective clothing. Therefore, routine safety precautions are expected to provide adequate worker health protection. Worker exposure would be highest under this alternative because more insecticide would be expected to be used.

Individuals with hypersensitivity to the insecticides might be affected. APHIS would offer to compile a list of persons who wish to be listed and would either avoid treating areas near their homes or would contact them prior to treatment. Hypersensitive individuals would be advised to avoid treatment blocks.

Some stakeholders have indicated that they are opposed to any treatments on public rangelands because they believe treatments would disrupt ecosystems, cause human health problems or provide an unacceptable advantage to agricultural interests. The anxiety levels of these stakeholders may be increased by adoption of this alternative versus the No Action Alternative.

Pesticide spills could expose individuals to excessive levels of insecticide. APHIS maintains spill kits and insures that program personnel are familiar with procedures to mitigate effects associated with a spill. Probability of a spill would be highest under this alternative because more insecticide would be expected to be used.

Entomophobic persons may have reduced anxieties vs. the No Action Alternative. Entomophilic persons may have increased anxieties vs. the No Action Alternative.

Carbaryl is of moderate acute oral toxicity to humans. The mode of toxic action of carbaryl occurs through inhibition of acetylcholinesterase (AChE) function in the nervous system. This inhibition is reversible over time if exposure to carbaryl ceases. The Environmental Protection Agency (EPA) has classified carbaryl as "a possible human carcinogen" (EPA, 1993). However, it is not considered to pose any mutagenic or genotoxic risk. Potential exposures to the general public from conventional application rates are infrequent and of low magnitude. These low exposures to the public pose no risk of direct toxicity, carcinogenicity, neurotoxicity, genotoxicity, reproductive toxicity, or developmental toxicity. The potential for adverse effects to workers is negligible if proper safety procedures are followed, including wearing the required protective clothing. Therefore, routine safety precautions are expected to provide adequate worker health

protection. Probability of exposure would be greater than under the No Action Alternative.

The acute oral toxicity of diflubenzuron formulations to humans ranges from very slight to slight. The most sensitive indicator of exposure and effects of diflubenzuron in humans is the formation of methemoglobin (a compound in blood responsible for the transport of oxygen) in blood. Potential exposures to the general public from Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative rates are infrequent and of low magnitude. These low exposures to the public pose no risk of methemoglobinemia (a condition where the heme iron in blood is chemically oxidized and lacks the ability to properly transport oxygen), direct toxicity, neurotoxicity, genotoxicity, reproductive toxicity, or developmental toxicity. Potential worker exposures are higher than the general public but are not expected to pose any risk of adverse health effects. Probability of exposure would be greater than under the No Action Alternative.

Malathion is of slight acute oral toxicity to humans. The mode of toxic action of malathion occurs through inhibition of AChE function in the nervous system. Unlike carbaryl, AChE inhibition from malathion is not readily reversible over time if exposure ceases. However, strong inhibition of AChE from malathion occurs only when chemical oxidation results in formation of the metabolite malaoxon. Human metabolism of malathion favors hydroxylation and seldom produces much malaoxon. Potential exposures to the general public from conventional application rates are infrequent and of low magnitude. These low exposures to the public pose no risk of direct toxicity, neurotoxicity, genotoxicity, reproductive toxicity, or developmental toxicity. Potential worker exposures are higher, but still have little potential for adverse health effects except under accidental scenarios. Therefore, routine safety precautions are expected to continue to provide adequate protection of worker health. Probability of exposure would be greater than under the No Action Alternative.

EPA has recently reviewed the potential for carcinogenic effects from malathion. EPA's classification describes malathion as having "suggestive evidence of carcinogenicity, but not sufficient to assess human carcinogenic potential" (EPA, 2000). This indicates that any carcinogenic potential of malathion cannot be quantified based upon EPA's weight of evidence determination in this classification. The low exposures to malathion from program applications would not be expected to pose carcinogenic risks to workers or the general public. Probability of exposure would be greater than under the No Action Alternative.

Fish and aquatic invertebrates

Insecticides have the potential to affect animals in aquatic ecosystems. Should they enter water, there is the potential to affect the aquatic invertebrate assemblage, especially amphipods. Field studies concluded that there was no biologically significant effect on aquatic resources, although invertebrate downstream drift increased for a short period after treatment due to toxic effects (Beyers *et al.* 1995). Fish are not likely to be affected at any concentrations that could be expected under this Alternative. Although the risk of

contamination of water must be rated higher than under the No Action Alternative, untreated buffer areas around all water would prevent entry of toxic concentrations into the water. Insecticide concentrations in runoff waters are addressed in the EIS pg C-6. Under worst case scenarios, runoff from a storm intensity of one inch resulted in negligible concentration of insecticide in the runoff water. Probability charts generated by Western Regional Climate Center show that storm intensities of half that magnitude are extremely rare in the proposed project area.

Qualitative assessments and field studies reported in the 2002 EIS, pp B46-B51 indicate that, under worst case scenarios, depressions of invertebrate populations might occur but the decreases would be temporary. No impacts would be expected on any vertebrate species.

Carbaryl is moderately toxic to most fish (Mayer and Ellersieck, 1986), very highly toxic to all aquatic insects and highly to very highly toxic to most aquatic crustaceans. Should carbaryl enter water, there is the potential to affect the aquatic invertebrate assemblage, especially amphipods. Field studies with carbaryl concluded that there was no biologically significant effect on aquatic resources, although invertebrate downstream drift increased for a short period after treatment due to toxic effects (Beyers *et al.*, 1995). Probability of exposure would be greater than under the No Action Alternative.

Diflubenzuron is slightly to practically nontoxic to fish, aquatic snails, and most bivalve species. The median lethal concentration of diflubenzuron in water to the snail *Physa* sp. is greater than 125 mg/L. It is very highly toxic to most aquatic insects, crustaceans, horseshoe crabs, and barnacles. Diflubenzuron is most likely to affect immature terrestrial insects and early life stages of aquatic invertebrates (Eisler, 2000). Many of the aquatic organisms most susceptible to diflubenzuron are marine organisms that would not be exposed to rangeland treatments. Freshwater invertebrate populations would be reduced if exposed to diflubenzuron, but these decreases would be expected to be temporary given the rapid regeneration time of many aquatic invertebrates. Probability of exposure would be greater than under the No Action Alternative.

The acute toxicity of malathion varies widely from slightly toxic to some species of fish to very highly toxic to other species. Malathion is moderately to very highly toxic to most aquatic invertebrates. The median lethal concentration of malathion ranges from 0.5 g/L in the scud to 3,000 g/L in the aquatic sowbug. The median lethal concentration of malathion to insects ranges from 0.69 g/L in the stonefly nymph to 385 g/L in snipe fly larvae. The median lethal concentration of malathion to a bivalve is 12 g/L. A No Effect Concentration was determined for mud snail to be 22,000 g/L. Malathion concentrations in water, as a result of grasshopper treatments, are expected to present a low risk to aquatic organisms, especially those organisms with short generation times. Probability of exposure would be greater than under the No Action Alternative.

Mammals
Carbaryl is of moderate acute oral toxicity to mammals (McEwen *et al.*, 1996a).

The acute oral toxicity of diflubenzuron to mammals ranges from very slight to slight. Little, if any, bioaccumulation of diflubenzuron would be expected (Opdycke *et al.*, 1982). Because diflubenzuron is a chitin inhibitor that disrupts insects from forming their exoskeleton, organisms without a chitinous exoskeleton, such as mammals are largely unaffected by diflubenzuron.

The acute oral toxicity of malathion is very slight to moderate for mammals. The acute oral median lethal doses of malathion range from 250 mg/kg in rabbits to 12,500 mg/kg in rats. The acute toxicity of malathion by the dermal route is one of the lowest of the organophosphorus insecticides.

Reptiles and amphibians
Carbaryl is slightly to moderately toxic to amphibians and reptiles. The reference dose used in the 2002 EIS was 4000 mg/kg as an LD50 for bullfrog.

Diflubenzuron is slightly toxic to reptiles or amphibians. Based upon the selective nature of the toxic mode of action, the relative toxicity of diflubenzuron to these species is anticipated to be similar to that of mammals and birds.

The toxicity of malathion is relatively low to adult reptiles and amphibians, but malathion is highly toxic to the immature aquatic stages. Studies of adult salamanders and lizards exposed to field applications (up to 6 oz a.i./acre) of malathion found no observable adverse effects and no AChE inhibition. The 96-hour median lethal concentration of malathion is 420 g/L for tadpoles of Fowler's toad and 200 g/L for tadpoles of the western chorus frog.

Stakeholders have expressed concern about toxicity of pesticides to frogs in Owyhee County. Amphibians are relatively resistant to diflubenzuron (Eisler 1992). The acute oral LD_{50} of carbaryl to bullfrogs is greater than 4000 mg/kg (Hudson et al, 1984) indicating that carbaryl is slightly toxic to amphibians. The toxicity of malathion is relatively low to adult amphibians but is highly toxic to aquatic stages (EIS pg B-43). The EIS shows estimated daily doses and reference doses for Woodhouse's toad as follows under the full coverage alternative:

	Estimated dose (mg/kg)	Reference dose 1/5 LD_{50}	LD_{50}	Ref. Species
Diflubenzuron	16.56	752	3762	Red-winged blackbird
Carbaryl	62.95	156	780	Sharp-tailed Grouse
Malathion	74.02	30	150	Chicken

Birds
Stakeholders have expressed concern about chronic and acute toxicity of insecticides to birds on rangeland. These concerns were well founded for grasshopper control programs conducted throughout much of the 20th Century. Originally, inorganic insecticides were

used, with a typical bran bait formulation incorporating 8 pounds of liquid sodium arsenite into 100 pounds of bran (Cowan 1929). For a brief span in the mid-20th century, synthetic organochlorine insecticides such as chlordane, toxaphene, dieldrin and aldrin came into use. These insecticides would accumulate in the birds or other animals which consumed poisoned grasshoppers, eventually leading to a toxic dosage level in the insectivores or their predators. USDA discontinued their recommendation for using organochlorine insecticides on grasshoppers in 1965 (McEwen et. al. 1972). The organochlorine insecticides were replaced with the organophosphate and carbamate insecticides. Certain of these are highly toxic to birds. Blus et. al. (1989) determined that sage grouse die-offs in Southeastern Idaho could be attributed to methamidophos and dimethoate treatments to agricultural fields used by the sage grouse. Martin et. al. (2000) determined that furadan treatments depressed cholinesterase levels in birds in study areas. APHIS protocols do not include insecticides (such as methamidophos, dimethoate, or furadan) that are highly toxic to birds or other terrestrial wildlife in the proposed suppression area.

Carbaryl applied at the proposed rate is unlikely to be directly toxic to upland birds, mammals, amphibians or reptiles. Carbaryl is not subject to significant bioaccumulation due to its low water solubility and low octanol-water partition coefficient (Dobroski *et al.*, 1985). Field studies have shown that carbaryl applied as either ultra-low-volume (ULV) spray or bait at Conventional rates posed little risk to killdeer (McEwen *et al.*, 1996a), vesper sparrows (McEwen *et al.*, 1996a; Adams *et al.*, 1994), or golden eagles (McEwen *et al.*, 1996b) in the treatment areas. AChE inhibition at 40 to 60 percent can affect coordination, behavior, and foraging ability in vertebrates. Multi-year studies conducted at several grasshopper treatment areas have shown AChE inhibition at levels of no more that 40 percent with most at less than 20 percent (McEwen *et al.*, 1996a). The risk of acute or chronic toxicity to birds or mammals would be negligible under this option.

Field studies have shown that carbaryl applied as either ultra-low-volume (ULV) spray or bait at Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative rates posed little risk to killdeer (McEwen *et al.*, 1996a), vesper sparrows (McEwen *et al.*, 1996a; Adam *et al.*, 1994), or golden eagles (McEwen *et al.*, 1996b) in the treatment areas. AChE inhibition at 40 to 60 percent can affect coordination, behavior, and foraging ability in vertebrates. Multi-year studies conducted at several grasshopper treatment areas have shown AChE inhibition at levels of no more that 40 percent with most at less than 20 percent (McEwen *et al.*, 1996a). Carbaryl is not subject to significant bioaccumulation due to its low water solubility and low octanol-water partition coefficient (Dobroski *et al.*, 1985). The risk of acute or chronic toxicity to birds or mammals would be negligible under this option. However, probability of exposure would be greater than under the No Action Alternative.

Diflubenzuron is slightly to very slightly toxic to mammals and birds. The primary concern for bird species has related to the effects of decreases in insect populations from insecticide applications on insectivorous species rather than to the direct toxicity to birds from diflubenzuron exposure. Diflubenzuron is most likely to affect immature terrestrial

insects and early life stages of aquatic invertebrates (Eisler, 2000). While this would reduce the prey base within the treatment area for organisms that feed on insects, adult insects, including grasshoppers, would remain available as prey items. Among birds, nestling growth rates, behavior data, and survival of wild American kestrels in diflubenzuron treated areas showed no significant differences among kestrels in treated areas and untreated areas (McEwen *et al.*, 1996b). Probability of exposure would be greater than under the No Action Alternative.

Malathion is slightly to moderately toxic to birds. The acute oral median lethal doses range from 150 mg/kg to chickens to 1,485 mg/kg to mallard ducks. The 5-day dietary median lethal concentrations for wild birds all exceed 2,500 ppm. Several reproductive and developmental studies have been conducted with birds. The lowest median lethal dose to chicken embryos (eggs) was 3.99 mg per egg for 4-day embryos. The median lethal concentration for field applications of malathion to mallard duck eggs was found to be 4.7 lbs a.i./acre. No effect on reproductive capacity of chickens was found at dietary concentrations as high as 500 ppm in feed. Malathion is not directly toxic to vertebrates at the concentrations used for grasshopper suppression, but it may be possible that sublethal effects to nervous system functions caused by AChE inhibition may lead directly to decreased survival. Field studies of birds within malathion treatment areas showed that, in general, the total number of birds and bird reproduction were not different from untreated areas (McEwen *et al.*, 1996a). Malathion does not bioaccumulate (HSDB, 1990; Tsuda *et al.*, 1989). However, probability of exposure would be greater than under the No Action Alternative.

Qualitative assessments and field studies reported in the 2002 EIS, pp B36-B45 indicate that there would be negligible risk of adverse toxicological effects to most vertebrate species even when full coverage and traditional treatment rates (carbaryl @ 0.50 lb active ingredient /acre; diflubenzuron @ 0.016 lb active ingredient /acre; and malathion @ 0.62 lb active ingredient /acre) are used. Possible exceptions were noted for the indicator species-- grasshopper mouse, Bobwhite quail, American Kestrel, and Woodhouse's toad. Individuals of these species might receive doses in excess of the calculated reference dose for 1/5 of the LD50 value (grasshopper mouse 60.37 mg/kg carbaryl, Bobwhite quail 56.67 mg/kg, American Kestrel 50.64 mg/kg malathion, and Woodhouse's toad 74.02 mg/kg).

However, Bobwhite quail do not occur in or near the proposed treatment area except for a few scattered locations in the Boise Valley. A species of concern, sage grouse, do occur in or near the proposed treatment area. The estimated daily dose of malathion for sage grouse under the full coverage/traditional treatment rates method would be 13.91 mg/kg. The reference dose for 1/5 of the LD50 value would be 30 mg/kg. Therefore, no significant adverse toxicological effect would be expected on sage grouse, even at full coverage/traditional rates of applications.

George et al. surveyed birds on 13 grasshopper treatment blocks up to 37,000 acres in size in North Dakota, Utah, Colorado, Wyoming and Idaho. They found little evidence

of differences in bird population responses to treatments with carbaryl bait, carbaryl spray, Nosema locustae, or malathion.

Stakeholders have strongly expressed concern regarding the reduction of insects as a food source for rangeland insectivores, especially sage grouse and sharp-tailed grouse chicks. In this alternative, the application rates chosen for the insecticide is reduced from the maximum rate allowed by EPA. This reduction in rate along with the use, whenever possible, of carbaryl bait or diflubenzuron spray which are more selective for grasshoppers than for most other species leaves alternative insect fauna for foraging insectivores (Paige and Ritter 1999). Because APHIS would only treat significant outbreak populations, numbers of grasshoppers surviving the treatment can provide ample nourishment for the insectivores. Additionally, Martin et. al. (2000) and Howe, et. al. (2000) found that Canadian grassland and Idaho shrub steppe bird species were able to make adaptive changes when insecticidal spray reduced the numbers and changed the composition of insect prey species. Howe et al. (1996) tested the hypotheses that malathion-induced food-base reduction might affect daily nest survivorship, percent of eggs hatched, percent of young fledged, mean number fledged per nest attempt, and mean fledging age of Brewer's sparrows and sage thrashers in southern Idaho. They found no direct effects and marginal indirect effects of malathion treatment on nestling growth and survival. They concluded that the insecticide treatments did not reduce insect population levels below the threshold needed to support the birds.

Prey available to insectivores would be less than under this alternative than under the No Action Alternative, the RAATS Alternative and the Modified RAATS Alternative.

Terrestrial invertebrates
Insecticides would affect nontarget insects within the Grasshopper treatment area. Field studies have shown that many affected insect populations can recover rapidly after spray or bait treatments and generally have suffered no long-term effects, including some insects that are particularly sensitive, such as bees (Catangui *et al.* 1996).

Nontarget insect species which would be put at risk by treatments under this alternative include non-native biological control agents and pollinators. The level of risk would be greater than the No Action Alternative. The majority of the non-native biological control agents in the proposed suppression area result from release programs carried out by land management agencies and others. The Nez Perce Biological Control Center in Lapwai provides database service which allows managers to report locations of biocontrol releases and the status of biocontrol agent populations. APHIS would consult with land managers and the Nez Perce Biological Control Center to determine the location and status of biological control agent populations and would select treatment options (including buffering areas) which minimize negative impacts on the populations.

The most widespread, managed, non-native pollinator in the proposed suppression area is the honeybee. Honeybees are found throughout and near the proposed suppression area. APHIS would provide beekeepers with notification of the suppression program and

would conduct surveys to detect beeyards in or near proposed treatment blocks. Risk to honeybees would be greater than the risk under the No Action Alternative.

Managed native pollinators include leafcutter and alkali bees. These species might be found in the proposed treatment area, but they are usually encountered in crop areas adjacent to the rangeland. APHIS would conduct surveys and would consult with private landowners to determine if managed native pollinators are near proposed treatment blocks. Most treatments in the proposed program would involve dialog with agricultural producers whose crops were at risk. They would inform APHIS of managed pollinator locations. Risk to managed native pollinators would be higher than the risk under the No Action Alternative.

Unmanaged native pollinators include a vast array of insects and other animals. In general, the insect fauna within this group is more susceptible to contact insecticide sprays than to carbaryl bait or diflubenzuron spray. Risk to unmanaged native pollinators would be greater than the risk under the No Action Alternative.

Insect biodiversity

There might be a temporary decrease in insect biodiversity within treatment blocks.

Carbaryl bait would affect some nontarget insects that consume the bait within the grasshopper treatment area. Field studies have shown that affected insect populations can recover rapidly and generally have suffered no long-term effects, including some insects that are particularly sensitive to carbaryl, such as bees (Catangui *et al.*, 1996). The use of carbaryl in bait form generally has considerable environmental advantages over liquid insecticide applications: bait is easier than liquid spray applications to direct toward the target area, bait is more specific to grasshoppers, and bait affects fewer nontarget organisms than sprays (Quinn, 1996).

Diflubenzuron is most likely to affect immature terrestrial insects and early life stages of aquatic invertebrates (Eisler, 2000). In addition, adult insects, including wild and cultivated bees, would be mostly unaffected by diflubenzuron applications (Schroeder *et al.*, 1980; Emmett and Archer, 1980).

Malathion would most likely affect nontarget insects within a treatment area. Large reductions in some insect populations would be expected after a malathion treatment under Insecticide Applications at Conventional Rates and Complete Area Coverage Alternative. While the number of insects would be diminished, there would be some insects remaining. The remaining insects would be available prey items for insectivorous organisms, and those insects with short generation times may soon increase.

To maximize the protection of these organisms, APHIS would select carbaryl bait or diflubenzuron to suppress grasshopper outbreaks whenever possible. Risk to terrestrial invertebrates would be greater than the risk under the No Action Alternative.

Plants
Versus the No Action Alternative, Grasshopper feeding damage would be reduced on rangeland plants, including desirable and undesirable plants, and to crops near rangeland. Reduction of the Grasshopper feeding damage may be viewed as having both negative and positive impacts. Grasshoppers feed on invasive weeds such as rush skeletonweed. Limiting the damage Grasshoppers do to invasive weeds would be perceived by most observers as a negative impact. Limiting the damage Grasshoppers do to desirable plants would be perceived by most observers as a positive impact.

Decreasing the amount of foliage consumed by Grasshoppers can make more forage available to other herbivores which may be more highly valued by stakeholders. Livestock, game animals and non-game animals compete with Grasshoppers for forage and shelter in rangeland. This alternative would make more forage and shelter available for other species versus No Action Alternative.

Because diflubenzuron is a chitin inhibitor that disrupts insects from forming their exoskeleton, organisms without a chitinous exoskeleton are largely unaffected by diflubenzuron.

None of the insecticides proposed for use in the program would be phytotoxic to shrubs, forbs or grasses at the rates proposed for use. There might be secondary effects on plant reproduction if the proposed treatment reduced pollinator populations in the proposed treatment area. Significant reduction in pollinators would not be expected with any of the proposed insecticides other than malathion. Operational protocols would limit the use of malathion.

There are no known studies indicating that insecticides may effect species composition of intact biological soil crusts (US Department of the Interior 2001).

Spills
Pesticide spills could expose wildlife to excessive levels of insecticide. APHIS maintains spill kits and insures that program personnel are familiar with procedures to mitigate effects associated with a spill. The risk of pesticide spills is roughly equivalent to the risk under Insecticide Applications to Smaller Rangeland Blocks to Protect Specific Resources Alternative. The risk of pesticide spills would be greater than under the No Action Alternative.

Socioeconomic issues
The risk that grasshopper outbreaks on rangeland would decrease the availability of forage for wildlife, cattle and sheep is less than under the No Action Alternative.

Versus the No Action Alternative, there would be reduced risk of major unchecked movement of grasshoppers into traditional or organic crops. There would be less crop loss and fewer expenditures for insecticidal control in the crop fields because the overall grasshopper population would be reduced.

Cultural resources and events
The availability of grasshoppers for fish bait and other human uses would be reduced from outbreak levels to more normal levels. Persons using rangelands for recreation would respond to grasshoppers as they do under normal conditions versus under outbreak conditions.

Artificial surfaces
Carbaryl and malathion can damage some painted surfaces. Automotive and sign finishes are susceptible to damage by carbaryl and malathion, and automobile or sign owners could suffer economic loss repairing cosmetic damage. APHIS would not apply treatments to un-abandoned vehicles in treatment blocks. APHIS would consult with land managers to insure that Native American petroglyphs are excluded from direct treatment if they occur within treatment blocks. The probability of damage to artificial surfaces by the treatments under this alternative is negligible.

Probability of damage to artificial surfaces by grasshoppers would be reduced versus the No Action Alternative.

3. Reduced Agent Area Treatments (RAATs) Alternative
Under RAATs Alternative, APHIS would participate in grasshopper programs with the option of using one of the insecticides carbaryl, diflubenzuron, or malathion, depending upon the various factors related to the grasshopper outbreak and the site-specific characteristics. The use of an insecticide would occur at reduced rates:

- 8.0 fluid ounces (0.25 lb a.i.) of carbaryl spray per acre; or
- 10.0 pounds (0.20 lb a.i.) of 2 percent carbaryl bait per acre; or
- 0.75 fluid ounce (0.012 lb a.i.) of diflubenzuron per acre; or
- 4.0 fluid ounces (0.31 lb a.i.) of malathion per acre.

And with coverage reduced to less than 100% coverage of any and all treatment blocks. APHIS has generally applied the RAATs alternative with 50% coverage of rangeland spray blocks in the tallgrass and shortgrass prairie areas where large treatments have occurred in recent years. For analysis here, APHIS will utilize assumption of 100% and 75% coverage for Idaho conditions and crop protection programs.

APHIS would not apply more than a single treatment in an outbreak year to affected rangeland areas in an attempt to suppress grasshoppers. APHIS would not apply a treatment for grasshoppers to an area which had already been treated for Mormon crickets during the current calendar year.

General
The implementation of pesticide label instructions and restrictions, the APHIS treatment guidelines (Appendix 1), additional protective measures specified within this EA, and the further reduction of insecticide rates and areas of application included in this alternative would reduce potential impacts of the program use of insecticides.

Human health

Human exposure to insecticides would occur. Potential exposures of the general public to insecticides are infrequent and of low magnitude under this alternative. These low exposures to the public pose no risk of direct toxicity, carcinogenicity, neurotoxicity, genotoxicity, reproductive toxicity, or developmental toxicity. Public exposure would be greater under this alternative than under the No Action Alternative unless grasshopper outbreaks resulted in widespread insecticide use by state and private entities on state and private lands. Public exposure would be reduced under this alternative vs Insecticide Application at Conventional Rates and Complete Area Coverage Alternative because less insecticide would be expected to be used. Compared to the Insecticide Application at Conventional Rates and Complete Area Coverage Alternative this alternative represents 50% to reduction in the amount of carbaryl or malathion applied to a treatment block and a 25% reduction in the amount of diflubenzuron applied to a treatment block if 100% of the block was treated. If 75% of the block was treated the reductions for carbaryl and malathion would be 63% and the reduction for diflubenzuron would be 44% compared to the Insecticide Application at Conventional Rates and Complete Area Coverage Alternative.

Personnel working on the suppression program would be exposed during handling, loading and application of the insecticides. Routine safety precautions are expected to provide adequate worker health protection. Worker exposure would be reduced under this alternative because less insecticide would be expected to be used in total versus the Insecticide Application at Conventional Rates and Complete Area Coverage Alternative.

Individuals with hypersensitivity to the insecticides might be affected. APHIS would offer to compile a list of persons who wish to be listed and would either avoid treating areas near their homes or would contact them prior to treatment. Hypersensitive individuals would be advised to avoid treatment blocks. Because less insecticide would be applied to public rangelands under this alternative vs the Insecticide Application at Conventional Rates and Complete Area Coverage Alternative, probability of exposure of hypersensitive persons should be reduced. However, if this alternative failed to adequately control grasshopper outbreaks on federally managed rangelands, treatments applied to state and private lands might increase the probability of exposure of hypersensitive persons.

Some stakeholders have indicated that they are opposed to any treatments on public rangelands because they believe treatments would disrupt ecosystems, cause human health problems or provide an unacceptable advantage to agricultural interests. The anxiety levels of these stakeholders may be increased by adoption of this alternative versus the No Action Alternative. Based on comments provided by some of these stakeholders it seems reasonable to expect their anxiety level would be increased if any amount of insecticide was used.

Pesticide spills could expose individuals to excessive levels of insecticide. Probability of a spill would be lowered under this alternative because less insecticide would be expected to be used.

Entomophobic persons may have reduced anxieties vs. the No Action Alternative. Depending on the extent of their entomophobia, their anxiety level may not differ from that expected under the Insecticide Application at Conventional Rates and Complete Area Coverage Alternative or the MRAATs Alternative. Entomophilic persons may have increased anxieties vs. the No Action Alternative. Depending on the extent of their entomophilia, their anxiety level may not differ from that expected under the Insecticide Application at Conventional Rates and Complete Area Coverage Alternative or the MRAATs Alternative.

Fish and aquatic invertebrates
Insecticides have the potential to affect animals in aquatic ecosystems. Should they enter water, there is the potential to affect the aquatic invertebrate assemblage, especially amphipods. Field studies concluded that there was no biologically significant effect on aquatic resources, although invertebrate downstream drift increased for a short period after treatment due to toxic effects (Beyers *et al.* 1995). Fish are not likely to be affected at any concentrations that could be expected under this Alternative. Although the risk of contamination of water must be rated higher than under the No Action Alternative, it is less than under the Insecticide Application at Conventional Rates and Complete Area Coverage Alternative and somewhat less than under the MRAATs Alternative. Untreated buffer areas around all water would prevent entry of toxic concentrations into the water. Insecticide concentrations in runoff waters are addressed in the EIS pg C-6. Under worst case scenarios, runoff from a storm intensity of one inch resulted in negligible concentration of insecticide in the runoff water. Probability charts generated by Western Regional Climate Center show that storm intensities of half that magnitude are extremely rare in the proposed project area.

Qualitative assessments and field studies reported in the 2002 EIS, pp B60-B62 indicate that, under worst case scenarios, depressions of invertebrate populations might occur but the decreases would be temporary. No impacts would be expected on any vertebrate species.

Probability of exposure to carbaryl would be greater than under the No Action Alternative but reduced from the Conventional Rates and Complete Coverage alternative because Carbaryl would be applied one half the rate contemplated in that alternative. Additionally, the percentage of the treatment block which actually receives direct treatment would be reduced.

Probability of exposure to diflubenzuron would be greater than under the No Action Alternative but less than the Conventional Rate and Complete Coverage Alternative because the application rate of Diflubenzuron would be reduced by one quarter. Additionally, the percentage of the treatment block which actually receives direct treatment would be reduced.

Probability of exposure to malathion would be greater than under the No Action Alternative but lessened compared to the Conventional Rates and Complete Coverage

Alternative because Malathion would be applied at only one half the rate contemplated in that alternative. Additionally, the percentage of the treatment block which actually receives direct treatment would be reduced.

Mammals
Exposure of mammals to insecticides would be reduced versus the Insecticide Application at Conventional Rates and Complete Area Coverage Alternative in keeping with the reduced application rates of the insecticides and the reduced coverage of treatment blocks. Exposure would be greater than under the No Action Alternative unless grasshopper outbreaks were not adequately controlled by this alternative and prompted extensive treatments of nonfederal land.

Reptiles and amphibians
Exposure of reptiles and amphibians to insecticides would be reduced versus the Insecticide Application at Conventional Rates and Complete Area Coverage Alternative in keeping with the reduced application rates of the insecticides and the reduced coverage of treatment blocks. Exposure would be greater than under the No Action Alternative unless grasshopper outbreaks were not adequately controlled by this alternative and prompted extensive treatments of nonfederal land.

Stakeholders have expressed concern about toxicity of pesticides to frogs in Owyhee County. Amphibians are relatively resistant to diflubenzuron (Eisler 1992). The acute oral LD_{50} of carbaryl to bullfrogs is greater than 4000 mg/kg (Hudson et al, 1984) indicating that carbaryl is slightly toxic to amphibians. EIS shows estimated daily doses and reference doses for Woodhouse's toad as follows under the full coverage alternative:

	Estimated dose (mg/kg)	Reference dose 1/5 LD_{50}	LD_{50}	Ref. Species
Diflubenzuron	16.56	752	3762	Red-winged blackbird
Carbaryl	62.95	156	780	Sharp-tailed Grouse
Malathion	74.02	30	150	Chicken

The estimated dose under this alternative would be 31.48 mg/kg for carbaryl bait, 6.21 mg/kg for diflubenzuron, and 37.01 mg/kg for malathion.

Birds
Carbaryl, diflubenzuron or malathion applied at the proposed rate is unlikely to be directly toxic to birds. The risk of acute or chronic toxicity to birds would be negligible under this option.

However, probability of exposure would be greater than under the No Action Alternative. Probability of exposure would be reduced compared to the Conventional Rates and Complete Coverage Alternative.

Stakeholders have strongly expressed concern regarding the reduction of insects as a food source for rangeland insectivores, especially sage grouse and sharp-tailed grouse chicks. In this alternative, the insecticide application rates are reduced well below the maximum rate allowed by EPA. This reduction in rate along with the use, whenever possible, of carbaryl bait or diflubenzuron spray which are more selective for grasshoppers than for most other species leaves alternative insect fauna for foraging insectivores. Additionally the untreated areas within treatment blocks leave refugia for insects of all types. Because APHIS would only treat significant outbreak populations, numbers of grasshoppers surviving the treatment can provide ample nourishment for the insectivores.

Numbers of prey available to insectivores would be less under this alternative than under the No Action Alternative but greater than under the Conventional Rates and Complete Coverage Alternative. Numbers of prey available to insectivores would be similar to that under the MRAATs Alternative.

Terrestrial invertebrates
Insecticides would affect nontarget insects within the Grasshopper treatment area. Impacts under this alternative would be considerably less than under the Conventional Rates and Complete Coverage Alternative. Impacts under this alternative would be expected to be roughly equivalent to the MRAATs Alternative. The level of risk would be greater than the No Action Alternative.

Risk to honeybees, managed native pollinators, and unmanaged native pollinators would be greater than the risk under the No Action Alternative but less than the risk under the Conventional Rates and Complete Coverage Alternative. Risk to honeybees under this alternative would be greater than under the MRAATs Alternative because this alternative includes carbaryl spray and MRAATs does not.

Insect biodiversity
There might be a temporary decrease in insect biodiversity within treatment blocks. To maximize the protection of these organisms, APHIS would select carbaryl bait or diflubenzuron to suppress grasshopper outbreaks whenever possible. Risk to terrestrial invertebrates would be greater than the risk under the No Action Alternative but less than the risk under the Conventional Rates and Complete Coverage Alternative. Under this alternative, risk of decreasing insect biodiversity would be greater than under the MRAATs Alternative because this alternative includes carbaryl spray and MRAATs does not.

Plants
Versus the No Action Alternative, Grasshopper feeding damage would be reduced on rangeland plants, including desirable and undesirable plants, and to crops near rangeland.

This alternative would make more forage and shelter available for wildlife species versus the No Action Alternative but it would make less forage available than the Conventional Rates and Complete Coverage Alternative. It is predicted that the amount of protection afforded to plants under this alternative would be somewhat less than under MRAATs

Alternative because insecticide rates under this alternative might insufficiently suppress grasshopper outbreaks.

Spills
The risk of pesticide spills would be greater than under the No Action Alternative but less than the risk under the Conventional Rates and Complete Coverage Alternative because less pesticide would be used. The risk would be roughly equivalent to the MRAATs Alternative.

Socioeconomic issues
The risk that grasshopper outbreaks on rangeland would decrease the availability of forage for wildlife, cattle and sheep would be less than under the No Action Alternative. Versus the No Action Alternative, there would be reduced risk of major unchecked movement of grasshoppers into traditional or organic crops. There would be less crop loss and fewer expenditures for insecticidal control in the crop fields because the overall grasshopper population would be reduced. There would be an increased risk that grasshopper outbreaks would significantly decrease forage and damage crops under this alternative compared to the Conventional Rates and Complete Coverage Alternative. That risk would be slightly more under this alternative than under MRAATs.

Cultural resources and events
The availability of grasshoppers for fish bait and other human uses would be reduced from outbreak levels to more normal levels. Persons using rangelands for recreation would respond to grasshoppers as they do under normal conditions versus under outbreak conditions.

Artificial surfaces
The probability of damage to artificial surfaces by the treatments under this alternative is negligible.

Probability of damage to artificial surfaces by grasshoppers would be reduced versus the No Action Alternative.

4. Modified Reduced Agents Area Treatments (RAATs) Alternative (Preferred Alternative)
Under Modified RAATs Alternative, APHIS would participate in grasshopper programs with the option of using one of the insecticides carbaryl, diflubenzuron, or malathion, depending upon the various factors related to the grasshopper outbreak and the site-specific characteristics. The use of an insecticide would occur at rates:

- 10.0 pounds (0.50 lb a.i.) of 5 percent carbaryl bait per acre; or
- 10.0 pounds (0.20 lb a.i.) of 2 percent carbaryl bait per acre; or
- 0.75 fluid ounce (0.012 lb a.i.) of diflubenzuron per acre; or
- 6.0 fluid ounces (0.465 lb a.i.) of malathion per acre.

And with coverage reduced to <1% to 75% of any and all treatment blocks of grassland and <1% to 50% of any and all treatment blocks of sagebrush steppe.

APHIS has chosen MRAATs as the preferred alternative rather than any of the alternatives described in the 2002 EIS because:

> Under Idaho conditions diflubenzuron should be an adequate alternative to carbaryl spray. Both are normally used as early season treatments and diflubenzuron is less toxic to nontarget organisms.
>
> In some cases, the 2% bait option might be adequate;but in other cases, 5% bait might be required for quicker control.
>
> Malathion might be required for some later season treatments when grasshoppers are in very high populations and are immediately threatening crops.

APHIS would not apply more than a single treatment in an outbreak year to affected rangeland areas in an attempt to suppress grasshoppers. APHIS would not apply a treatment for grasshoppers to an area which had already been treated for Mormon crickets during the current calendar year.

General
The implementation of pesticide label instructions and restrictions, the APHIS treatment guidelines (Appendix 1), additional protective measures specified within this EA, and the further reduction of insecticide rates and areas of application included in this alternative would reduce potential impacts of the program use of insecticides.

Human health
Human exposure to insecticides would occur. Potential exposures of the general public to insecticides are infrequent and of low magnitude under this alternative. These low exposures to the public pose no risk of direct toxicity, carcinogenicity, neurotoxicity, genotoxicity, reproductive toxicity, or developmental toxicity. Public exposure would be greater under this alternative than under the No Action Alternative unless grasshopper outbreaks resulted in widespread insecticide use by state and private entities on state and private lands. Public exposure would be reduced under this alternative vs Insecticide Application at Conventional Rates and Complete Area Coverage Alternative because less insecticide would be expected to be used.

Compared to the Insecticide Application at Conventional Rates and Complete Area Coverage Alternative this alternative represents 44% reduction in the amount of malathion applied to a treatment block, a 24% reduction in the amount of carbaryl bait, and a 44% reduction in the amount of diflubenzuron applied to a treatment block.

Compared to the RAATs alternative (which is calculated at the 100% coverage in the 2002 EIS) and assuming the maximum 75% coverage for this alternative, the maximum

amounts applied to a treatment block under this alternative would be: malathion 113%; carbaryl bait 190%, diflubenzuron 75%.

Therefore, potential exposure to carbaryl bait could be significantly higher under this alternative than under RAAts alternative, and exposures to other insecticides would be essentially equivalent.

Personnel working on the suppression program would be exposed during handling, loading and application of the insecticides. Routine safety precautions are expected to provide adequate worker health protection. Worker exposure would be reduced under this alternative because less insecticide would be expected to be used in total versus the Insecticide Application at Conventional Rates and Complete Area Coverage Alternative. Exposure would be roughly equivalent to the RAATS Alternative.

Individuals with hypersensitivity to the insecticides might be affected. APHIS would offer to compile a list of persons who wish to be listed and would either avoid treating areas near their homes or would contact them prior to treatment. Hypersensitive individuals would be advised to avoid treatment blocks. Because less insecticide would be applied to public rangelands under this alternative vs the Insecticide Application at Conventional Rates and Complete Area Coverage Alternative, probability of exposure of hypersensitive persons should be reduced. However, if this alternative failed to adequately grasshopper control outbreaks on federally managed rangelands, treatments applied to state and private lands might increase the probability of exposure of hypersensitive persons.

Some stakeholders have indicated that they are opposed to any treatments on public rangelands because they believe treatments would disrupt ecosystems, cause human health problems or provide an unacceptable advantage to agricultural interests. The anxiety levels of these stakeholders may be increased by adoption of this alternative versus the No Action Alternative. Based on comments provided by some of these stakeholders it seems reasonable to expect their anxiety level would be increased if any amount of insecticide was used.

Pesticide spills could expose individuals to excessive levels of insecticide. Probability of a spill would be lowered under this alternative versus the Insecticide Application at Conventional Rates and Complete Area Coverage Alternative because less insecticide would be expected to be used.

Entomophobic persons may have reduced anxieties vs. the No Action Alternative. Depending on the extent of their entomophobia, their anxiety level may not differ from that expected under the Insecticide Application at Conventional Rates and Complete Area Coverage Alternative or the RAATs Alternative. Entomophilic persons may have increased anxieties vs. the No Action Alternative. Depending on the extent of their entomophilia, their anxiety level may not differ from that expected under the Insecticide Application at Conventional Rates and Complete Area Coverage Alternative or the RAATs Alternative.

Fish and aquatic invertebrates
Fish are not likely to be affected at any concentrations that could be expected under this Alternative. Although the risk of contamination of water must be rated higher than under the No Action Alternative, it is less than under the Insecticide Application at Conventional Rates and Complete Area Coverage Alternative and somewhat more than under the RAATs Alternative. Untreated buffer areas around all water would prevent entry of toxic concentrations into the water. Insecticide concentrations in runoff waters are addressed in the EIS pg C-6. Under worst case scenarios, runoff from a storm intensity of one inch resulted in negligible concentration of insecticide in the runoff water. Probability charts generated by Western Regional Climate Center show that storm intensities of half that magnitude are extremely rare in the proposed project area.

Depressions of invertebrate populations might occur but the decreases would be temporary. No impacts would be expected on any vertebrate species.

Probability of exposure to carbaryl would be greater than under the No Action Alternative but reduced from the Conventional Rates and Complete Coverage alternative because Carbaryl would be applied at one half the rate contemplated in that alternative. Additionally, the percentage of the treatment block which actually receives direct treatment would be reduced.

Probability of exposure to diflubenzuron would be greater than under the No Action Alternative but less than the Conventional Rate and Complete Coverage Alternative because the application rate of Diflubenzuron would be reduced by one quarter. Additionally, the percentage of the treatment block which actually receives direct treatment would be reduced.

Probability of exposure to malathion would be greater than under the No Action Alternative but lessened compared to the Conventional Rates and Complete Coverage Alternative because Malathion would be applied at only one half the rate contemplated in that alternative. Additionally, the percentage of the treatment block which actually receives direct treatment would be reduced.

Mammals
Exposure of mammals to insecticides would be reduced versus the Insecticide Application at Conventional Rates and Complete Area Coverage Alternative in keeping with the reduced application rates of the insecticides and the reduced coverage of treatment blocks. Exposure would be greater than under the No Action Alternative unless grasshopper outbreaks were not adequately controlled by this alternative and prompted extensive treatments of nonfederal land.

Reptiles and amphibians
Exposure of reptiles and amphibians to insecticides would be reduced versus the Insecticide Application at Conventional Rates and Complete Area Coverage Alternative in keeping with the reduced application rates of the insecticides and the reduced coverage

of treatment blocks. Exposure would be greater than under the No Action Alternative unless grasshopper outbreaks were not adequately controlled by this alternative and prompted extensive treatments of nonfederal land.

Stakeholders have expressed concern about toxicity of pesticides to frogs in Owyhee County. Amphibians are relatively resistant to diflubenzuron (Eisler 1992). The acute oral LD_{50} of carbaryl to bullfrogs is greater than 4000 mg/kg (Hudson et al, 1984) indicating that carbaryl is slightly toxic to amphibians. EIS shows estimated daily doses and reference doses for Woodhouse's toad as follows under the full coverage alternative:

	Estimated dose (mg/kg)	Reference dose 1/5 LD_{50}	LD_{50}	Ref. Species
Diflubenzuron	16.56	752	3762	Red-winged blackbird
Carbaryl	62.95	156	780	Sharp-tailed Grouse
Malathion	74.02	30	150	Chicken

The estimated dose under this alternative would be 31.48 mg/kg for carbaryl bait, 6.21 mg/kg for diflubenzuron, and 55.52 mg/kg for malathion.

Birds
Carbaryl, diflubenzuron or malathion applied at the proposed rate is unlikely to be directly toxic to birds. The risk of acute or chronic toxicity to birds would be negligible under this option.

However, probability of exposure would be greater than under the No Action Alternative. Probability of exposure would be reduced compared to the Conventional Rates and Complete Coverage Alternative.

Stakeholders have strongly expressed concern regarding the reduction of insects as a food source for rangeland insectivores, especially sage grouse and sharp-tailed grouse chicks. In this alternative, the insecticide application rates are reduced well below the maximum rate allowed by EPA. This reduction in rate along with the use, whenever possible, of carbaryl bait or diflubenzuron spray which are more selective for grasshoppers than for most other species leaves alternative insect fauna for foraging insectivores. Additionally the untreated areas within treatment blocks leave refugia for insects of all types. Because APHIS would only treat significant outbreak populations, numbers of grasshoppers surviving the treatment can provide ample nourishment for the insectivores.

Numbers of prey available to insectivores would be less under this alternative than under the No Action Alternative but greater than under the Conventional Rates and Complete Coverage Alternative. Numbers of prey available to insectivores would be similar to that under the RAATs Alternative.

Terrestrial invertebrates
Insecticides would affect nontarget insects within the Grasshopper treatment area. Impacts under this alternative would be considerably less than under the Conventional Rates and Complete Coverage Alternative. Impacts under this alternative would be expected to be roughly equivalent to the RAATs Alternative. The level of risk would be greater than the No Action Alternative.

Risk to honeybees, managed native pollinators, and unmanaged native pollinators would be greater than the risk under the No Action Alternative but less than the risk under the Conventional Rates and Complete Coverage Alternative. Risk to honeybees under this alternative would be less than under the RAATs Alternative because this alternative does not include carbaryl spray and RAATs does.

Insect biodiversity
There might be a temporary decrease in insect biodiversity within treatment blocks. To maximize the protection of these organisms, APHIS would select carbaryl bait or diflubenzuron to suppress grasshopper outbreaks whenever possible. Risk to terrestrial invertebrates would be greater than the risk under the No Action Alternative but less than the risk under the Conventional Rates and Complete Coverage Alternative. Under this alternative, risk of decreasing insect biodiversity would be less than under the RAATs Alternative because this alternative does not include carbaryl spray and MRAATs does.

Plants
Versus the No Action Alternative, Grasshopper feeding damage would be reduced on rangeland plants, including desirable and undesirable plants, and to crops near rangeland.

This alternative would make more forage and shelter available for wildlife species versus the No Action Alternative but it would make less forage available than the Conventional Rates and Complete Coverage Alternative. It is predicted that the amount of protection afforded to plants under this alternative would be somewhat more than under RAATs Alternative because insecticide rates under this alternative might insufficiently suppress grasshopper outbreaks.

Spills
The risk of pesticide spills would be greater than under the No Action Alternative but less than the risk under the Conventional Rates and Complete Coverage Alternative because less pesticide would be used. The risk would be roughly equivalent to the RAATs Alternative.

Socioeconomic issues
The risk that grasshopper outbreaks on rangeland would decrease the availability of forage for wildlife, cattle and sheep would be less than under the No Action Alternative. Versus the No Action Alternative, there would be reduced risk of major unchecked movement of grasshoppers into traditional or organic crops. There would be less crop loss and fewer expenditures for insecticidal control in the crop fields because the overall grasshopper population would be reduced. There would be an increased risk that

grasshopper outbreaks would significantly decrease forage and damage crops under this alternative compared to the Conventional Rates and Complete Coverage Alternative. That risk would be slightly less under this alternative than under RAATs.

Cultural resources and events
The availability of grasshoppers for fish bait and other human uses would be reduced from outbreak levels to more normal levels. Persons using rangelands for recreation would respond to grasshoppers as they do under normal conditions versus under outbreak conditions.

Artificial surfaces
The probability of damage to artificial surfaces by the treatments under this alternative is negligible.

Probability of damage to artificial surfaces by grasshoppers would be reduced versus the No Action Alternative.

B. Other Environmental Considerations

1. Cumulative Impacts

Cumulative impacts are discussed in the 2002 EIS, pp 61, B23-B26, B28.

For the general public, repeated exposure to carbaryl is a relatively minor concern. Applications for suppression of grasshoppers would not be repeated within a given season and outbreaks are not necessarily an annual occurrence. Therefore exposures resulting from the proposed action would be infrequent. Because the dosage required for neurotoxic effects would not exceeded, even in short-term accidental exposures such as, encountering a spill, it is unlikely that repeated brief exposure, even over several seasons, would lead to neurotoxic effects. Members of the public who utilize carbaryl to control pests in their home gardens, on their pets, or in other circumstances might experience multiple exposures, but no adverse effects would be expected as long as products are used according to EPA label requirements. If the land manager had utilized or anticipated utilizing another cholinesterase inhibiting insecticide on the proposed treatment area within a 12-month period, APHIS would not select carbaryl for use in a proposed program.

Program workers would be exposed to higher doses of carbaryl than the general public, and the exposure might occur over a relatively prolonged period of time—during a treatment season or several treatment seasons. Program workers would be required to participate in cholinesterase monitoring as a safety measure.

Any cumulative effects from the use of diflubenzuron would be likely to be additive if the exposures were in the same treatment season. The proposed program would not apply diflubenzuron more than once per season, and diflubenzuron would not be used for other purpose within the proposed treatment area. Diflubenzuron is not widely used for any other purposes than grasshopper control in Idaho. No cumulative effects are expected from one year to the next. Few other insecticides with the same mode of action as diflubenzuron are utilized in Idaho.

For the general public, repeated exposure to malathion should not be a concern. Applications for suppression of grasshoppers would not be repeated within a given season and outbreaks are not necessarily an annual occurrence. Therefore exposures resulting from the proposed action would be extremely infrequent. Because the dosage required for neurotoxic effects would not exceeded, except in the event of short-term accidental exposures due to a spill, it is unlikely that repeated brief exposure, even over several seasons, would lead to neurotoxic effects. Members of the public who utilize malathion to control pests in their homes, gardens, or in other circumstances might experience multiple exposures, but no adverse effects would be expected as long as products are used according to EPA label requirements. If the land manager had utilized or anticipated utilizing another cholinesterase inhibiting insecticide on the proposed treatment area within a 12-month period, APHIS would not select malathion for use in a proposed program.

Program workers would be exposed to higher doses of malathion than the general public, and the exposure might occur over a relatively prolonged period of time—during a treatment season or several treatment seasons. Program workers would be required to participate a monitoring program to ensure that they do not experience a depression of acetylcholinesterase.

2. Synergistic Effects
Synergistic effects are discussed in the 2002 EIS, pp B13, B16, B20-B21.

Diflubenzuron is only reported to be synergistic with the defoliant DEF. Because the defoliant is unlikely to be applied to rangeland concurrently with grasshopper suppression treatments, there is minimal risk of synergistic effects. However, diflubenzuron has potential for cumulative or synergistic effects with nonpesticidal compounds known to bind hemoglobin. For example, exposure to cigarette smoke and carbon monoxide from incomplete combustion can result in binding of hemoglobin. Exposure to diflubenzuron after these exposures can result in additional binding of hemoglobin and the greater risk associated with less oxygen transport by blood.

The only studies of chemical interactions with carbaryl indicate that toxicity of organophosphates combined with carbaryl is additive not synergistic.

The toxicity of malathion may be potentiated by some other organophosphates and carbamates. Dichlorvos and naled were not found to be synergistic with malathion, but only additive. Diazinon is synergistic with malathion. Public health programs utilizing insecticidal spray to control mosquitoes or other flying insects in Idaho do not use insecticides known to be synergistic with malathion. Nonetheless, if the land manager or other parties had utilized or anticipated utilizing another cholinesterase inhibiting insecticide on the proposed treatment area within a 12-month period, APHIS would not select malathion for use in a proposed program.

3. Inert Ingredients and Metabolites
Inert ingredients and metabolites are discussed in the 2002 EIS, pp B12-B13, B15-B16, and B20.

The major hydrolytic metabolites of carbaryl are glucaronides and sulfates. Most metabolites such as naphthol are considerably less toxic than carbaryl. There has been some concern expressed about the reaction of carbaryl with nitrite under certain circumstances. This may result in the formation of N-nitrosocarbaryl which has been shown to be mutagenic and carcinogenic in laboratory tests.

Although the formulations of carbaryl (i.e., Sevin® 4-oil) used in some previous programs had oil-based carriers, current programs have converted to water-based carriers (i.e., SEVIN® XLR PLUS). Some information about inert ingredients in these formulations is available, but actual concentrations of inert ingredients was not located. One inert ingredient is propylene glycol or propanediol (antifreeze agent). It degrades readily to carbon dioxide and water in soil and water environments after applications, so actual exposures from the grasshopper suppression program would only be acute. The low exposures to humans would not expect to have human health effects except to those few individuals experiencing allergic contact dermatitis. Program safety procedures preclude applications when unprotected people are present in the treatment area, so any adverse effects from program applications are unlikely. Propylene glycol is practically nontoxic to fish and daphnia. Concentrations of propylene glycol from program application rates would not be anticipated to result in adverse effects to wildlife.

The primary metabolites of diflubenzuron are 4-chlorophenylurea (CPU) and 2,6-difluorobenzoic acid. The acid metabolite is further metabolized by microorganisms in one to two weeks in soil. The CPU degrades in soil in about five weeks. The rapid metabolism and degradation of this metabolite's low concentrations make it highly unlikely that there would be sufficient exposure to cause any of the adverse toxicological effects noted in these studies.

Various carriers and adjuvants can be used with diflubenzuron to enhance the pesticide applications. These are primarily synthetic and natural oils. These inert ingredients may include light and heavy paraffinic oils, polyethylene glycol nonylphenyl ether, alkylaryl polyether-ethanols, vegetable oil surfactants, and canola oil. Food-grade canola oil would not be expected to pose any noteworthy hazards, and would be the carrier chosen for the proposed program. Polyethylene glycol nonylphenyl ether has generally not been of human health concern except for a few cases of allergic contact dermatitis. This should not be an issue if proper program safety precautions are followed. This compound does not persist in natural environments and is unlikely to show bioconcentration of residues.

The main impurities of concern in malathion formulations are isomalathion (95 times as toxic as malathion) and malaoxon (68 times as toxic as malathion). Isomalathion formation results from improper storage or handling of malathion formulations. There is some petroleum-based oil that occurs in some ULV formulations. The exposure of birds'

eggs and humans to this oil has been shown to have no adverse effects at program application rates.

4. Executive Order No. 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

Although specific data are not available, observations indicate that Hispanics and Asians are the minority groups which would be most impacted by the suppression programs because of their involvement in agricultural production systems.

No Action Alternative may cause Hispanic and Asian farm workers to be exposed to additional insecticides applied to cropland. No Action Alternative may increase costs of operation for Asian and Hispanic farm operators. The other Alternatives would have no disproportionate impact on minority or low income populations.

Differential human health effects of Carbaryl on individuals with poor nutritional status are analyzed in the 2002 EIS, pg B25.

5. Executive Order No. 13045, Protection of Children from Environmental Health Risks and Safety Risks

The human health risk assessment for the 2002 EIS, pp B24-B25, analyzed the effects of exposure of children to carbaryl and other insecticides. Based on review of the insecticides and their use in the grasshopper/Mormon cricket program, the risk assessment concluded that the likelihood of children being exposed to insecticides is very slight and that no disproportionate adverse effects to children are anticipated over the negligible effects to the general population. Treatments are primarily conducted on open rangelands where children would not be expected to be present. No urban areas or schools would be subject to treatment under the proposed action.

Potential for impacts of pesticides on children would be minimized by the implementation of the treatment guidelines, standard operational procedures and added measures included in III.D.7.

6. Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds

In accordance with various environmental statutes, APHIS routinely conducts programs in a manner that minimizes impact to the environment, including any impact to migratory birds. In January 2001, President Clinton signed Executive Order 13186 to ensure that all government programs protect migratory birds to the extent practicable. To further its purposes, this Executive Order requires each agency with a potential to impact migratory birds to enter into an MOU with FWS. In compliance with the Executive Order, APHIS is currently working with FWS to develop such an MOU.

7. Endangered Species Act

Policies and procedures for protecting endangered and threatened species of wildlife and plants were established by the Endangered Species Act (ESA) of 1973, as amended (16 United States Code (U.S.C.) 1531 *et seq.*). The ESA is designed to ensure the protection

of endangered and threatened species and the habitats upon which they depend for survival. Regulations implementing the provisions of the ESA have been issued. In accordance with section 7 of the ESA, consultation is to be conducted for any action authorized, funded, or carried out by a Federal agency that may affect listed endangered or threatened species or their habitats. APHIS includes proposed species in their consultations. Consultations are conducted with Fish and Wildlife Service (FWS) for terrestrial species and most aquatic species and with the NOAA Fisheries for marine and anadromous species.

The most recent national biological opinion on the grasshopper program was issued by FWS July 21, 1995. In following years, no national biological assessment was prepared since control programs were not anticipated in most states due to lack of funding. A national biological assessment for the Rangeland Grasshopper and Mormon Cricket Suppression Program is currently under way, but the process for its completion and consideration by FWS will not be concluded in time for the 2006 season. In order to comply with the Section 7 requirements, APHIS conducts ongoing informal consultations with FWS, locally. The 1995 biological opinion and 1998 biological assessment will be used as a basis for these local consultations and are incorporated into this EA by reference. Of the insecticides proposed for use in earlier assessments, carbaryl bait, and malathion spray have been retained for potential use under this EA. Local consultations have been conducted with FWS for diflubenzuron in since 2000. For this EA, APHIS conducted informal consultation with FWS, Snake River Basin Office and arrived at determinations of protective measures which were needed in addition to those derived from earlier Biological Opinions. In 2003 through 2005 APHIS conferred with NOAA Fisheries Boise Idaho office and determined that consultation was not required if the proposed suppression area excluded watersheds of the Salmon river and the Snake River below Brownlee Dam.

Bald Eagle, *Haliaeetus leucocephalus*

The bald eagle is listed as a threatened species in all contiguous 48 States. Bald eagle habitat in Southeast Idaho is located along the South Fork, the Henry's Fork and the main Snake River. The South Fork, Henry's Fork and main Snake River is considered year long habitat with the majority of the eagles present during the winter months. There are active bald eagle nests on all of the forks of the Snake River. Some immature birds have been seen at American Falls Reservoir during early spring nest occupancy survey flights.

> APHIS would maintain 1.0-mile radius treatment-free zone with no fly overs around active nests found on rivers and lakes. To protect prey species a 500 foot ground buffer and a .25 mile aerial buffer would be maintained along rivers or lakes used for foraging for 2.5 miles up and downstream from active nests. Lakes considered foraging areas would have a 0.25 mile no-aerial treatment buffer.

Bull Trout, *Salvelinus confluentus*

Bull trout have been listed as threatened under the ESA. Within the area included in this proposal, bull trout are distributed throughout the Boise, Payette and Weiser River

systems. Proposed bull trout critical habitat is also distributed throughout the basins. Bull trout naturally exhibit a patchy distribution, and would not likely occupy all areas of the basins at once. The primary threat to bull trout is habitat fragmentation and degradation. Other factors which threaten bull trout include competition from brook trout.

> In all areas occupied by bull trout APHIS would utilize a 500 foot buffer for carbaryl bait. For aerial applications of diflubenzuron or malathion a 0.5 mile buffer would be maintained. If there are treatment needs within the buffer area, APHIS would consult with FWS on a case by case basis to examine alternatives (FWS 2003).

The following four listed mollusks either occupy aquatic habitat found in select springs or they occur on substrate in the main stem Snake River:

Bliss Rapids Snail, *Taylorconcha serpenticola*; Idaho Springsnail, *Fontelicella idahoensis*, Snake River Physa Snail, *Physa natricina,* and the Bruneau Hot Springsnail, *Pyrgulopsis bruneauensis*

Bliss Rapids Snail, *Taylorconcha serpenticola*

The Bliss Rapids snail has primarily been found on cobble-boulder substrate in flowing reaches of the main stem Snake River and alcove springs. River populations have been found in spring-influenced habitat or near the edge of rapids.

Idaho Springsnail, *Fontelicella idahoensis,* Snake River Physa Snail, *Physa natricina*

The Idaho Springsnail and Snake River Physa snail are both main stem Snake River species which occurs in a relatively short segment of the Snake River.

> In areas along the Snake River APHIS would utilize 500 foot buffer for carbaryl bait. For aerial applications of diflubenzuron or malathion a 0.5 mile buffer would be maintained. If there are treatment needs within the buffer area, APHIS would consult with FWS on a case by case basis to examine alternatives. (FWS 2003)

Bruneau Hot Springsnail, *Pyrgulopsis bruneauensis*

Adult Bruneau hot springsnails have a small shell that is 0.22 inches long. Fresh shells are thin and transparent. Because the shells are clear to white, the pigmentation underneath makes the snail appear black. This freshwater snail occurs in a 5-mile reach of the Bruneau River and the lower one-third of its tributary, Hot Creek, in Owyhee County, Idaho. The snail is native to geothermal springs and seeps with temperatures ranging from 15.7 to 36.9 degrees Celsius. It is found in these habitats on the exposed surfaces of various substrates including rocks, sand, gravel, mud, and algal films.

This snail was first discovered in 1952 in upper Hot Creek, a tributary to the Bruneau River in southwest Idaho. It belongs to the family Hydrobiidae, and was formally described in 1990 as *Pyrgulopsis bruneauensis*, or more commonly, Bruneau hot springsnail.

The principal threat to the springsnail is the reduction and/or elimination of their geothermal spring habitat as a result of agricultural groundwater withdrawals.

Within the recovery area, as defined in the final BHSS recovery plan, APHIS would maintain a 0.5 mile buffer for all aerial sprays of Dimilin and malathion ,with a 500 foot buffer for carbaryl bait treatments. If there are treatment needs within the buffer, APHIS will consult with USFWS on a case by case basis.

Gray Wolf, *Canis lupus*

The gray wolf has been determined to be an endangered species. Since the translocation of wolves from Canada, the population in Idaho south of Interstate Highway 90 is considered "experimental, non-essential" under Section 10(j) of the Endangered Species Act. Wolves range along the continental divide and into the Island Park area around Yellowstone National Park (YNP). Sightings of gray wolves have been made in diverse parts of the proposed suppression area.

High impact unlikely as a result of proposed pesticides at proposed rates of application. (FWS 06/01/87)

Canada Lynx, *Lynx canadensis*

On March 24, 2000, the U. S. Fish and Wildlife Service listed the Canada lynx as a Threatened species under the ESA of 1973, as amended. This took effect on April 24, 2000. The proposed treatment areas may be near habitat suitable for Canada lynx foraging, movement and dispersal activities. In Idaho, lynx are thought to primarily occur in the higher elevation, cold forest habitats which support spruce, subalpine fir, whitebark pine and lodgepole pine. Shrub/steppe habitats which occur adjacent to, or are intermixed with, cold forest habitats in Idaho are thought to be used to a limited extent by lynx for foraging and dispersal activities.

APHIS would not treat forested areas or rangelands that are not adjacent to crops but are surrounded by forest and are above 5000 feet in elevation in Idaho. (FWS2003)

Northern Idaho Ground Squirrel, *Spermophilus brunneus brunneus*

The northern Idaho ground squirrel is smaller than most ground squirrels at about 8-9" long. Reddish-brown spots dot its coat, and the squirrel has a short, narrow tail, tan feet and ears, and a grey-brown throat. This rare squirrel needs large quantities of grass seed, stems and other green leafy vegetation to store body energy for its eight-month hibernation from August through March. Adult males (2 years old) emerge from their burrows first in early spring, usually March or early April, followed by the females and then their young.

In 1985, scientists estimated that over 5,000 ground squirrels inhabited west-central Idaho. The animals occurred in open meadows and shrub/grasslands among coniferous forests of older Ponderosa pines and Douglas fir.

The northern Idaho ground squirrel's population has been greatly reduced, and today it is found within 20 square miles of public and private lands near Council, Idaho. At high risk of extinction, this animal has suffered a 92% decline in population from 1985 to 1999. Fewer than 500 northern Idaho ground squirrels are estimated to be living at present.

The major threat to the northern Idaho ground squirrel is habitat loss due to conifer invasion and fire suppression. Other potential threats include agricultural land conversion, urban development, recreational activities, and naturally occurring events such as severe droughts lasting longer than three years.

To protect this species, APHIS would consult with USFWS on a case by case basis to determine what, if any, treatments would be used in areas occupied by northern Idaho ground squirrel. (APHIS/USFWS 2005)

Proposed Species

Slickspot Peppergrass, *Lepidium papilliferum*

Slickspot peppergrass was included on the federal proposed list in 2002 but the proposal was withdrawn in January 2004. On August 19, 2005, the withdrawal was reversed by court order, and the species is currently proposed for Threatened status. This annual or biennial forb occurs in sagebrush-steppe habitats in southwest Idaho, where it typically grows on micro sites known as slick spots. It is presently known from approximately 45 to 60 sites in Idaho. Many of these sites are adjacent to agricultural lands that have previously been sprayed, especially in the Kuna area.

Robertson (2002) suggested that halictid bees, chrysomelid beetles, dermestid beetles, gelechiid moths and, perhaps, bombyliid flies are capable of pollinating *L. papilliferum.* Robertson and Klemash (2003) reported that 25 insect families from five orders visited flowers, and that seed set is reduced when insects are excluded from flowers. Robertson (2003a) suggested that the apparent reliance of slickspot peppergrass on insect-mediated pollination has significant consequences for the long term viability of the species because of the isolated occurrences of populations. Gravity, wind, and water are all believed to play at least some role in seed dispersal. It is possible that ants do as well, since slickspots are occasionally associated with anthills. Robertson (2003b) reported herbivory by insects on *L. papilliferum* and suggested it might have an effect on survival and fruit production. He also determined that halictid bees are one of the main pollinators of *L. papilliferum*. He also found that sphecid and vespid wasps and tachinid and bombyliid flies can be efficient pollinators.

Species of grasshoppers which commonly reach outbreak populations in southern Idaho include *Melanoplus sanguinipes* and *Oedaleontus enigma*. *Melanoplus bivittatus* can also be very abundant on a local basis. Pfadt (1994) reported each of these three species to include pepperweed (*Lepidium* spp.) in their food preferences. Capinera and Sechrist (1982) also reported a study in which *M. bivittatus* preferred plants of the mustard family early in the season.

APHIS would abide by provisions of the Candidate Conservation Agreement for Slickspot Peppergrass recently developed by several cooperators in Idaho.

APHIS would conduct no aerial spraying within 3 miles of known sites unless land managers made a special request in order to protect the plant from Mormon crickets.

Candidate Species

Yellow-billed cuckoo, *Coccyzus americanus*

The yellow-billed cuckoo is a secretive, robin-sized songbird that lives in the Western United States in willow and cottonwood forests along rivers and streams. The birds are generally absent from heavily forested areas and large urban areas. Yellow-billed cuckoos primarily eat large insects such as caterpillars and cicadas, as well as an occasional small frog or lizard. Cuckoos usually lay two or three eggs, and the young develop very rapidly. On average, it takes 17 days from egg-laying to fledging of young. Yellow-billed cuckoos breed from southern Canada south to the Greater Antilles and Mexico. While the yellow-billed cuckoo is common east of the Continental Divide, biologists estimate that more than 90 percent of the bird's riparian habitat in the West has been lost or degraded as a result of conversion to agriculture, dams and riverflow management, bank protection, overgrazing, pesticide use, and competition from exotic plants such as tamarisk.

Populations have declined rapidly throughout the western U.S. in the twentieth century, and are extirpated from British Columbia, Washington, and possibly Nevada. In Idaho, the species is considered a rare visitor and breeder in the Snake River Valley, occurring in nine of the counties within the proposed suppression area.

Because the birds are primarily found in riparian areas, potential threats include conversion of this habitat to agriculture, dams and riverflow management, bank protection, livestock overgrazing, agricultural water use, pesticide use, and competition from exotic plants.

APHIS would utilize buffers around all water bodies to provide protection for this candidate species. (FWS2003)

Columbia Spotted Frog, *Rana luteiventris*

The spotted frog is olive green to brown in color, with irregular black spot. They may have white, yellow, or salmon coloration on the underside of the belly and legs. Tadpoles are black when small, changing to a dark then light brown as they increase in size. Spotted frogs are about one inch in body length at metamorphosis, can attain a length of four inches as adults, and can live more than ten years. They begin reproducing in their second or third year. Softball-sized egg masses are deposited in shallow, calm water in March and April, depending on weather and climate. Tadpoles hatch two to three weeks later, eventually moving from breeding sites to any connected wet areas and feeding on algae, plant material and detritus. Tadpoles transform into small juvenile frogs between

late July and November, at which time they forage on tiny insects before seeking shelter for winter hibernation.

Spotted frogs live in spring seeps, meadows, marshes, ponds and streams, usually where there is abundant vegetation. They often migrate along riparian corridors between habitats used for spring breeding, summer foraging, and winter hibernation. Depending on climate and habitat conditions, spotted frogs may begin seeking overwinter sites as early as September. Springs, cutbanks, and willow roots provide quality habitat for hibernacula that are well-oxygenated and stable in temperature.

Prior to 1997, the Columbia spotted frog and the Oregon spotted frog, *Rana pretiosa*, were lumped into one species, *Rana pretiosa*. Additional genetic information indicated that they are two separate species. Columbia spotted frogs have been further divided into four populations, including the Great Basin population. The Great Basin population is found in Eastern Oregon, Southwestern Idaho, and Nevada. In Idaho, it occurs in the mid-elevations of the Owyhee uplands and in Southern Twin Falls County.

Threats to the Great Basin population of Columbia spotted frogs include grazing, spring development, road and trail construction, water diversion, fire in riparian corridors, pesticides, disease, and the introduction of non-native fish. Increasing habitat fragmentation due to activities that reduce riparian connectivity makes local populations vulnerable to extirpation.

APHIS would utilize buffers around all water bodies to provide protection for this candidate species. (FWS2003) To avoid potential harm to the Columbia spotted frog APHIS would use a 50 ft buffer from the edge of the riparian zone or wet meadow in treatment areas in the Owyhee and Bruneau Field Offices on the south side of the crest of the Owyhee Mountain Range. The BLM will provide APHIS field crews with a one day training session to assist in the identification of the riparian and wet meadow areas of concern.

Southern Idaho Ground Squirrel, *Spermophilus brunneus endemicus*

The Southern Idaho ground squirrel is about 8-9" long, with a short, narrow tail, tan feet and ears, and a grey-brown throat. This small-eared mammal differs from a similar subspecies the Northern Idaho ground squirrel in pelage coloration. The southerns have a noticeably paler coat than the northerns, which is attributed to the lower-elevation, sagebrush/grassland habitat in which it lives. The granitic sands and clays of the Weiser River Basin are thought to influence the Southern Idaho ground squirrel's lighter coloration, while the deeper reddish-colored northerns are found in higher-elevation areas with shallow reddish soils of basaltic origin. Research suggests that the squirrels prefer areas with a high percentage of native cover such as big sagebrush, bitterbrush and a variety of native forbs and grasses; however, some nonnative features may enhance their survival such as alfalfa fields, haystacks or fence lines.

These squirrels spend much of their time underground. Adults emerge from seasonal hibernation in late January or early February, depending on elevation and habitat

conditions. As with other ground squirrels in the Northwest, the adults have a short active season aboveground of 4 to 5 months. During this time, the animals feed on large quantities of grass seed, stems and green leafy vegetation which are required for storage of fat to survive long months of hibernation. When squirrels emerge from their burrows, they begin breeding; young are born about three weeks later and emerge from the nest burrow in about 50 days. The ground squirrels cease their above-ground activity by late June or early July to return to their burrows for hibernation.

During the past 30 years, a dramatic population decline of Southern Idaho ground squirrels has occurred. Surveys indicate a precipitous decline in squirrel populations since the mid-1980s. In 1985, one study estimated the population at around 40,000. A 1999 survey of 145 of the 180 known historical population sites indicated that only 53 sites (37 percent) were still occupied. Furthermore, 52 of the 53 sites had what biologists characterized as "remarkable low levels of activity". The Southern Idaho ground squirrel occurs within an 810-square mile area (Gem, Payette and Washington counties).

Threats to Southern Idaho ground squirrels include exotic grasses and weeds, habitat fragmentation, direct killing from shooting, trapping or poisoning, predation, competition with Columbian ground squirrels (Spermophilus columbianus), and inadequacy of existing regulatory mechanisms to protect the species or its habitat. Most of these threats occur throughout the range of the species.

APHIS would consult with USFWS before making any treatments within the area of concern for southern Idaho ground squirrel. Diflubenzuron would be used whenever practicable. (FWS2004)

Species under Review by U.S. Fish and Wildlife Service or Petitioned For Listing as T&E

Columbian Sharp-tailed Grouse and Sage Grouse

Both of these grouse species are BLM listed sensitive species. The Columbian sharp-tailed grouse has been petitioned for listing under the ESA. On February 7, 2003, FWS found that the Western subspecies of sage grouse is not eligible for federal protection under ESA. Young grouse hatch in the spring at about the same time as grasshopper populations begin to mature. Insects are a critical source of protein for the young birds. Large grasshopper populations are common in the habitat of both species.

Mulford's Milkvetch, Woven-Spore Lichen, and Malheur Princesplume

These plants are currently under review by the FWS for listing as federal candidate species.

Mulford's milkvetch is endemic to Southwest Idaho and extreme Southeast Oregon, where it grows in deep sandy soils. It is typically associated with bitterbrush, needle-and-thread grass, and Indian ricegrass. In Idaho, Mulford's milkvetch is known from Ada, Owyhee, Payette, and Washington counties. While no information is available regarding its pollination biology, Mulford's milkvetch is believed to be insect pollinated. Seed

dispersal is most likely by gravity and wind. Although no data are readily available, it may be consumed by grasshoppers.

Woven-spore lichen grows on humus in sagebrush-steppe habitats in Southwest Idaho, Central Oregon, and Southern Washington. Several localities are also known from Southern California. Woven-spore lichen has been found at 14 localities in Idaho, all within Ada and Elmore counties. Most of the sites are adjacent to or are surrounded by private land. Nothing is known of its reproductive or dispersal mechanisms. Although no data are readily available, it may be consumed by grasshoppers.

The FWS initiated a status review for Malheur prince's-plume in 2000. This showy, three foot tall biennial plant species is known from six widely scattered localities in Gooding, Owyhee and Washington counties in southwest Idaho. It grows only on sparsely vegetated clay soils. Approximately 15 populations of Malheur prince's-plume are known from southeast Oregon in Harney and Malheur county. A variety of bees and beetles have been observed visiting the flowers, but no pollination studies have been conducted. Although no data are readily available, it may be consumed by grasshoppers.

Table 2.1 Protection Measures and Determinations for Special Status Species

Bald Eagle (T) Not likely to adversely affect (NLAA)	1-mile radius treatment-free zone around active aeries found on rivers and lakes with no flyovers of this area by contract pilots. Maintain a 2.5 mile no aerial treatment zone upstream and downstream from the nest site with a 0.25 mile buffer along each side of the river. Lakes considered foraging areas would have 0.25 mile no-aerial treatment buffer. (From FWS 06/01/87)
Bull Trout (T) NLAA	In all areas proposed as critical habitat for bull trout, APHIS would utilize a 500 foot buffer for carbaryl bait and a 0.5 mile buffer for diflubenzuron or malathion spray. If there are treatment needs within the buffer area, APHIS would consult with FWS on a case-by-case basis to examine alternatives. (FWS 2003)
Banbury Springs Limpet (lanx) (E), Bliss Rapids Snail (T), Utah Valvata Snail (E), Idaho Springsnail (E), Snake River Physa Snail (E) NLAA	In areas along the Snake River APHIS would utilize a 500 foot buffer for carbaryl bait and a 0.5 mile buffer for diflubenzuron or malathion spray. If there are treatment needs within the buffer area, APHIS would consult with FWS on a case-by-case basis to examine alternatives. (From FWS 2003)
Gray Wolf (E) (experimental) NLAA	High impact unlikely as a result of proposed pesticides at proposed rates of application. (FWS 06/01/87)
Canada Lynx (T) NE	APHIS would not treat forested areas or rangelands that are not adjacent to crops but are surrounded by forest and are above 5000 feet in elevation in Idaho. (FWS 2003)
Northern Idaho Ground Squirrel (T) NLAA	APHIS would consult with FWS on a case by case basis for any treatments to the land described by FWS as North Idaho Ground Squirrel recovery area. (FWS 2005)

Table 2.2 Protective Measures for Proposed Species

Slickspot Peppergrass (PE)	Insecticide application rates would be reduced below EPA maximum allowable rates. Carbaryl bait would be applied at no more than 50% of the labeled maximum rate, malathion would be applied at 75% of the labeled maximum rate, and diflubenzuron would be applied at 37.5% of the labeled maximum rate. Additionally, treatment blocks would not receive full area coverage. 50% to >99% of treatment block would not receive direct application under preferred alternative. APHIS would conduct no aerial spraying within 3 miles of known sites unless land managers made a special request in order to protect the plant from grasshoppers.

Table 2.3 Protective Measures for Candidate Species

Columbia Spotted Frog (C) Southern Idaho Ground Squirrel (C) Yellow-billed cuckoo (C)	Insecticide application rates would be reduced below EPA maximum allowable rates. Carbaryl bait would be applied at no more than 25% of the labeled maximum rate malathion would be applied at 50% of the labeled rate, and diflubenzuron would be applied at 37.5% of the labeled maximum rate under the preferred alternative. Additionally, treatment blocks would not receive full area coverage. 50% to >99% of treatment block would not receive direct application under preferred alternative. Aerial applications of carbaryl bait or diflubenzuron or malathion spray would not be made within 500 feet of water. Ground applications of carbaryl bait would not be made within 50 feet of water. APHIS would consult with USFWS before treating occupied Southern Idaho Ground Squirrel habitat. To avoid potential harm to the Columbia spotted frog APHIS would use a 50 ft buffer from the edge of the riparian zone or wet meadow in treatment areas in the Owyhee and Bruneau Field Offices on the south side of the crest of the Owyhee Mountain Range. The BLM will provide APHIS field crews with a one day training session to assist in the identification of the riparian and wet meadow areas of concern.

Table2.4 Protective Measures for Species Under Review or Sensitive Species

Bonneville Cutthroat Trout Yellowstone Cutthroat Trout and Redband Trout (S) Mulford's Milkvetch, Woven-Spore Lichen, Malheur Princesplume, Mourning Milkvetch, Picabo Milkvetch, Snake River Milkvetch, Janish's Penstemon, Matted Cowpie Buckwheat, and St. Anthony Evening Primrose (S) Western Burrowing Owl, Northern Harrier, Upland Game Birds and the Swainson's Hawk (S) Western Toad, Woodhouse's Toad, and Northern Leopard Frog (S) Western Ground Snake, Longnose Snake and Common Garter Snake (S) Townsend's Big Eared Bat, Spotted Bat, Western Small-footed Myotis, Long Eared Myotis, Fringed Myotis, Long-legged Myotis, Western Pipistrelle, and Yuma Myotis (S) Kit Fox (S)	Under the preferred alternative-- Insecticide application rates would be reduced below EPA maximum allowable rates. Percentage of EPA maximum allowable rates which would be applied: carbaryl bait 25% diflubenzuron spray 37.5% malathion spray 50% Additionally, treatment blocks would not receive full area coverage. 50% to >99% of treatment block would not receive direct application. Aerial applications of carbaryl bait or diflubenzuron or malathion spray would not be made within 500 feet of water. Ground applications of carbaryl bait would not be made within 50 feet of water.

8. Environmental Monitoring

Monitoring involves the evaluation of various aspects of the grasshopper suppression programs. There are three aspects of the programs that may be monitored. The first is the efficacy of the treatment. APHIS will determine how effective the application of an insecticide has been in suppressing the grasshopper population within a treatment area and will report the results in a Work Achievement Report to the Western Region.

The second area included in monitoring is safety. This includes ensuring the safety of the program personnel through medical monitoring conducted specifically to determine risks of a hazardous material. (See APHIS Safety and Health Manual (USDA, APHIS, 1998) available online at: www.aphis.usda.gov/mb/aseu/shes/shes-manual.html).

The third area of monitoring is environmental monitoring. APHIS Directive 5640.1 commits APHIS to a policy of monitoring the effects of Federal programs on the environment. Environmental monitoring includes such activities as checking to make sure the insecticides are applied in accordance with the labels, and that sensitive sites and organisms are protected. The environmental monitoring recommended for Mormon cricket and grasshopper suppression programs involves monitoring sensitive sites such as bodies of water used for human consumption or recreation or which have wildlife value. Additionally, monitoring may include endangered or threatened species habitat, other sensitive wildlife species habitat, edible crops, and any sites for which the public has expressed concern or where humans might congregate (e.g., schools, parks, hospitals). APHIS does conduct post-treatment assessments to determine if any non-target impacts may be attributed to the treatments. Observers monitor wildlife including migratory birds to determine if any mortality or unusual behaviors are exhibited.

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FY-2006
Guidelines for Treatment of Rangeland
for the Suppression of Grasshoppers and Mormon Crickets

Suppression Treatment on Federally Managed Rangeland

Subject to available funding, the United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine (USDA-APHIS-PPQ) may contribute to the control of grasshoppers and Mormon crickets on federal rangeland in three ways: (1) conduct field surveys, (2) provide technical assistance to land managers, and (3) participate in suppression treatments when requested and necessary. In situations when traditional practices of land managers fail to maintain grasshopper and Mormon cricket populations below outbreak levels, USDA-APHIS-PPQ, at the request of the Federal land management agency or Tribal authority, when appropriate and subject to available funding, may conduct suppression treatments on federally managed rangeland or rangeland held in Trust by the federal government.

Rangeland eligible for cooperative suppression treatments for grasshoppers include: (1) large rangeland blocks (i.e., ≥10,000 acres) that if treated would protect forage as well as prevent re-infestation from immigrant grasshoppers; (2) incipient populations ("hot spots") of grasshoppers that if treated would prevent a wider spread of outbreaks; and (3) Federal or Trust land borders that if treated would prevent the movement of damaging populations of grasshoppers to adjacent private agricultural land. Rangeland cooperative suppression treatments for Mormon crickets may be conducted on a small or large scale. The final determination of whether a cooperative suppression treatment on federal rangeland is warranted and feasible (biologically, logistically, and economically) will be made by USDA-APHIS-PPQ, upon receipt of the land manager's written request and based on the best available information.

Suppression Treatments on State and Private Rangeland

Subject to available funding, the USDA-APHIS-PPQ may contribute to the suppression of grasshoppers and Mormon crickets on State and private rangeland in three ways: (1) conduct field surveys, (2) provide technical assistance to landowners, and (3) participate in suppression treatments when requested and necessary. In situations when traditional practices of land managers fail to maintain grasshopper and Mormon cricket populations below outbreak levels, USDA-APHIS-PPQ, at the request of the State Department of Agriculture and/or private landowners, and subject to available funding, may conduct suppression programs on State and private rangeland.

State and private rangeland eligible for cooperative suppression treatments for grasshoppers include: (1) large rangeland blocks (i.e., ≥10,000 acres) that if treated would protect forage as well as prevent re-infestation from immigrant grasshoppers; and (2) incipient populations ("hot spots") of grasshoppers that if treated would prevent a wider spread of outbreaks. State and private rangeland cooperative suppression treatments for Mormon crickets may be conducted on a small or large scale. However, USDA-APHIS-PPQ will not participate in cooperative suppression programs for grasshoppers and Mormon crickets on private cropland, except when deemed necessary to maintain the integrity of a large spray block. Subject to available funding

and as mandated by the Plant Protection Act (PPA) of 2000, APHIS will conduct surveys, provide technical assistance and conduct suppression programs on rangeland to control grasshoppers and Mormon crickets as warranted and feasible both biologically and logistically.

General Guidelines for Suppression Programs on Rangeland

1. Cooperative suppression treatments will be completed in accordance with the Plant Protection Act (PPA) of 2000 and Agency policy. Suppression treatments will follow guidelines within the Environmental Impact Statement (EIS), Site-Specific Environmental Assessment (EA), Section 7 Consultation of the Endangered Species Act, 2004 Environmental Monitoring Plan, pesticide label, and the 2006 Guidelines stated herein.

2. The Grasshopper Program will follow all requirements of the National Environmental Protection Act (NEPA). Environmental Assessments (EAs) for suppression treatments on rangeland will be completed in accordance with National and/or local Memoranda of Understanding (MOUs) between USDA-APHIS-PPQ and the Federal land management agencies and/or Tribes. Prior to treatments and per Section 7 Consultation, USDA-APHIS-PPQ and/or the Federal land manager and/or Tribe will consult locally with U.S. Fish & Wildlife Service (USFWS) and/or National Oceanic and Atmospheric Administration (NOAA) Fisheries in situations where: (1) threatened or endangered species occur in the area, or (2) pesticides or application procedures utilized have not been addressed in the Programmatic Biological Opinion of 1995 or in other Opinions. Upon completion of the EA, the State Plant Health Director of USDA-APHIS-PPQ or his/her designee will, if appropriate, sign a Finding of No Significant Impact (FONSI), after which suppression treatments may commence.

3. The Federal Government will bear 100% of the cost of treatment on federally managed or Trust land, up to 50% of the cost on State land, and up to 33% of cost on private land. The Federal Government's participation in the cost share is contingent on allocation and availability of funds and written request of land manager. First, USDA-APHIS-PPQ will conduct or fund surveys from the congressional appropriation, then may conduct suppression treatments with any remaining funds, and if requested. Additional sources of support for suppression treatments may include Contingency funds, Commodity Credit Corporation (CCC) funds, Land Management Agencies' funds, or other funding resources.

4. Land managers are responsible for the overall management of rangeland under their control to prevent or reduce the severity of grasshopper and Mormon cricket outbreaks. It is recommended that the land managers have exhausted all Integrated Pest Management systems before USDA-APHIS-PPQ is asked to assess the suppression treatment of grasshopper and Mormon cricket outbreaks. USDA-APHIS-PPQ and/or its designated cooperator may conduct suppression treatments on Federal/Tribal lands if requested in writing by the Federal land manager and/or Tribal authority for Trust lands.

5. USDA-APHIS-PPQ, when requested by the land manager, may conduct border treatments on Federal or Trust rangeland in situations when damaging populations of grasshoppers and

Mormon crickets threaten private agricultural land. Border treatments can only be justified when the potential for damage from grasshoppers and Mormon crickets migrating into private agricultural lands constitutes a legitimate and justifiable threat.

6. At the written request of the respective State Department of Agriculture, and/or private landowner, USDA-APHIS-PPQ and/or the designated cooperator may conduct cooperative suppression programs on State and/or private rangeland, as permitted by regulations and available funding.

7. In the absence of available USDA-APHIS-PPQ funding, the Federal land management agency, Tribal authority or other party may opt to reimburse USDA-APHIS-PPQ for suppression treatments. Interagency agreements or reimbursement agreements must be completed prior to the start of treatments.

8. For rangeland programs conducted by the Federal government, USDA-APHIS-PPQ and/or cooperating personnel (i.e., cooperative agreement) will provide overall direction and monitoring of aircraft calibration, pesticide inventory and application, and will maintain records of pesticides used and acres treated. In a suppression program that requires a Contracting Officer (CO) a Contracting Officer Representative (COR) will be required, and a letter of authority issued. In other smaller programs it is recommended that a properly trained Grasshopper/Mormon Cricket manager be responsible for the program, and he or she will have received the necessary training as prescribed by PPQ.

9. In some cases, rangeland treatments may be conducted by other Federal agencies (e.g., Forest Service, Bureau of Land Management, or Bureau of Indian Affairs) or by non-Federal entities (e.g., Grazing Association or County Pest District). USDA-APHIS-PPQ may choose to assist these groups in a variety of ways, such as: (1) loaning equipment; (2) providing materials and pesticides; and (3) and contributing in-kind services such as surveys, determination of insect species and instars, and treatment monitoring. A cooperative agreement is needed when the assistance by USDA-APHIS-PPQ represents significant monetary value (e.g., providing pesticide or loaning equipment). Finally, the USDA-APHIS-PPQ State Plant Health Director (SPHD) is responsible for ensuring that any cooperative treatments on State or private rangeland adhere to the cost-share ratios in the Plant Protection Act and NEPA, as applicable.

10. Prior to initiating treatments funded by or through USDA-APHIS-PPQ, the SPHD's office will prepare a Detailed Work Plan (including a map), which then must be approved by the USDA-APHIS-PPQ Western Regional Office. In addition, the USDA-APHIS-PPQ State office will provide a weekly update to the Western Regional Office on acres treated and pesticides used. Upon completion of each grasshopper or Mormon cricket suppression program, the USDA-APHIS-PPQ State office will prepare a summary for the Federal land manager or Tribal authority and will submit a Post Treatment Report to the Western Regional Office.

11. The State Registered Beekeepers shall be notified in advance of proposed rangeland treatments so that beekeepers may remove their bees before a suppression program begins.

Observation aircraft may be used to check for bees in the proposed area. Registered bee locations must be documented on the treatment map. Non-treated buffer zones should be determined for pollinators (e.g., alkali, leafcutter or honey bees) based on the EA and the pesticide labels [See 2006 Operational Procedures below].

12. In accordance with the EIS, the following pesticides may be used for rangeland treatments of grasshoppers and Mormon crickets: Sevin XLR Plus, Carbaryl bait, Dimilin 2L, and Malathion ULV. All pesticides must be used in accordance with the label, NEPA documents, Biological Opinion, local Section 7 Consultation, 2006 Operational Procedures, and any pertinent local decisions that are more restrictive.

13. Treatment contracts will adhere to the 2006 Prospectus.

2006 Operational Procedures

GENERAL PROCEDURES FOR ALL AERIAL AND GROUND APPLICATIONS

1. Follow all applicable Federal, State, Tribal and local laws and regulations in conducting grasshopper and Mormon cricket suppression treatments.

2. Conduct scoping programs to allow public participation in the decision making process.

3. Notify Federal, State and Tribal land managers and private cooperators of grasshopper and Mormon cricket infestations on their lands. Describe estimated boundaries, severity of the infestation, and treatment options. This notification will request the land manager to advise USDA-APHIS-PPQ of any sensitive areas (e.g., parks, recreation areas, etc.) that may exist in the proposed treatment areas.

4. Obtain request(s), in writing, from land managers or landowners for suppression treatments to be undertaken on their land.

5. Notify residents within treatment areas, or their designated representatives, prior to proposed operations. Advise them of control method to be used, proposed method of application, and precautions to be taken.

6. Avoid residences and other premises whose occupants are opposed to their property being treated. In cases when State law requires treatment, but landowners or occupants are opposed to the treatments, USDA-APHIS-PPQ will cooperate to the extent possible and as authorized by Federal and State laws.

7. Instruct program personnel in the use of equipment, materials and procedures; supervise to ensure procedures are properly followed.

8. USDA-APHIS-PPQ employees who plan, supervise, recommend, or have the potential to perform pesticide treatments must be certified and trained under the USDA-APHIS-PPQ Pesticide Applicator Certification Policy. They are also required to fulfill any additional qualifications or pesticide use requirements of the State wherein they perform these duties. State Plant Health Directors have the option for seasonals to take the Pesticide Certification core training without the 2 day fumigation workshop. This only certifies that the seasonal had core Pesticide Certification training. Pesticide Applicator status is available to the seasonals with completed core pesticide training and the 2 day workshop as indicated by their supervisor. CFR 40 171.6 standard defines Supervision of a non-certified pesticide applicator as; The availability of the certified applicator must be directly related to the hazard of the situation. In many situations, where the certified applicator is not required to be physically present, “direct supervision” shall include verifiable instruction to the competent person, as follows: (1) Detailed guidance for applying the pesticide properly, and (2) provisions for contacting the certified applicator in the event he is needed. In other situations, and as required by the label, the actual physical presence of a certified applicator may be required when application is made by a non-certified applicator.

9. Strictly follow all EPA and State approved label instructions for insecticides.

10. Do not apply insecticides directly to water bodies (defined herein as reservoirs, lakes, ponds, pools left by seasonal streams, springs, wetlands, and perennial streams and rivers). Furthermore, provide the following buffers for water bodies: 500-foot buffer with aerial liquid insecticides; 200-foot buffer with aerial bait; and 50-foot buffer with ground bait.

11. Require unprotected workers to stay out of treated areas, according to the label re-entry requirements or until the insecticide has dried, whichever period is longer.

12. Protective clothing and equipment will be worn and used by all pilots, loaders, and field personnel, as specified on the label.

13. All insecticide containers must be stored and disposed of properly according to the label. Rinse solution for drums may be used as diluents in preparing spray tank mixes, or it may be collected and stored for subsequent disposal in accordance with label instructions. Use one of the following disposal methods (in order of preference):

    a) Use full service contracts and require the contractor to properly store and dispose of pesticide containers.

    b) Require chemical companies, distributors, or suppliers to accept the triple-rinsed containers.

    c) Crush and/or puncture the empty triple-rinsed containers, report on Form AD-112 to Property Services, Field Servicing Office, Minneapolis, MN, and dispose of as scrap metal.

    d) Other suitable methods as approved locally in concurrence with Safety, Health and Environmental Security (SHES; Bill Benson, 301-734-5577).

14. Conduct mixing, loading, and unloading in areas where an accidental spill would not contaminate a water body. In the event of an accidental spill, follow the procedures set forth in PPQ Guidelines for Managing Pesticide Spills (USDA APHIS, *Treatment Manual*, 1996, pages 11.17-11.26) and the 1996 Aerial Application Manual (4.37-4.39).

15. Local law enforcement agencies and fire officials will be notified of pesticide storage areas and treatment blocks. Be sure MSDS sheets are available to local law enforcement, local medical and to application personnel.

16. All APHIS project personnel will have baseline cholinesterase tests before the first application of AChe inhibiting insecticides, such as organophosphates or carbamates (i.e., no testing required for dimilin usage), and on a routine basis as described in the *APHIS Safety and Health Manual*. It is recommended that contract, State, and private project personnel also participate in a cholinesterase monitoring program.

17. Endangered Species Act Compliance

    a) a. Formal consultations with US Fish and Wildlife Service up through July 21, 1995 guide the program on a national basis through biological assessments and biological opinions. For Federal Threatened, Endangered, and Proposed Species issues which have arisen since 1995, local informal consultation with Fish and Wildlife Service and/or NOAA Fisheries is required.

    b) b. State-listed endangered and threatened species, Federal candidate species, and other sensitive areas may be addressed in the site-specific EA.

18. USDA-APHIS-PPQ will assess rangeland programs for the efficacy of the treatment, to verify that control programs have properly been implemented and treatments fall within our guidelines and control levels.

SPECIFIC PROCEDURES FOR AERIAL APPLICATIONS

1. Aircraft, dispersal equipment and pilots that do not meet all contract requirements of the 2006 Prospectus will not be allowed to operate on the Program.

2. Use Global Positioning System (GPS) coordinates or shape files if available, for pilot guidance on the parameters of the spray block. Ground flagging or markers should accompany GPS coordinates, when necessary, in delineating the project area and in omitting areas from treatment (e.g., boundaries and buffers for bodies of water, habitats of protected species, etc.).

3. Utilize two-way communication equipment for appropriate field personnel. Communication will be available for continuous contact between pilots and the COR.

4. Pre-spray reconnaissance flights or ground orientation trips may be conducted to ensure that pilots are familiar with program area boundaries, buffers, and areas that are not to be treated.

5. Make the following available to all personnel in advance of any treatment: First Aid kits, pesticide spill kits, thermometers, flagging material, wind gauges, spray-deposit samplers, and daily aircraft records. Examples of contents of the first aid and Pesticide spill kits are in the GH Manual.

6. No treatments will occur over congested urban areas. Whenever possible, plan aerial ferrying and turnaround routes to avoid flights over congested areas, water bodies, and other sensitive areas that are not to be treated.

7. To minimize drift and volatilization, do not conduct aerial applications when any of the following conditions exist in the treatment area: wind velocity exceeds 10 miles per hour (unless lower wind speed required under State law); air turbulence could seriously affect the

normal spray pattern; and temperature inversions could lead to off-site movement of spray. Also, suspend aerial applications when the following weather conditions occur and will seriously impede pesticide efficiency: rain (present or imminent), fog, or wet foliage.

8. Weather conditions at the treatment area will be monitored by trained personnel before and during application. Operations will be suspended at any time that weather conditions could jeopardize the safe and/or effective placement of the spray on target areas.

9. Weather plays an important role in aerial application. Winds may displace the pesticide within the target area. High temperatures combined with low humidity may cause fine sprays to evaporate and drift away without reaching the target. The best weather for spraying is usually from dawn through mid-morning. A simple indicator of time-to-quit is soil/air temperature difference. The soil temperature should be taken by placing the thermometer probe on an un-shaded site while shading the thermometer for three minutes before reading. Air temperature should be taken five feet above the surface, in the open but with the thermometer shaded. When the soil temperature rises above the air temperature, the spray pattern normally starts breaking up, at which time treatment operations should cease. Constant monitoring of the spray deposit pattern is the best method of determining the effects of weather factors.

10. Do not apply while school buses are operating in the treatment area. Do not apply within 500 feet of schools or recreational facilities.

11. Protection of Bees:

    a) When off-season or early-season planning indicates an area may require treatment, send early notification letters and maps of the proposed treatment areas to all registered apiarists in the State or near the area.

    b) Pre-spray reconnaissance flights may be conducted to ensure that honey bees and other bees used as commercial crop pollinators have been moved or protected.

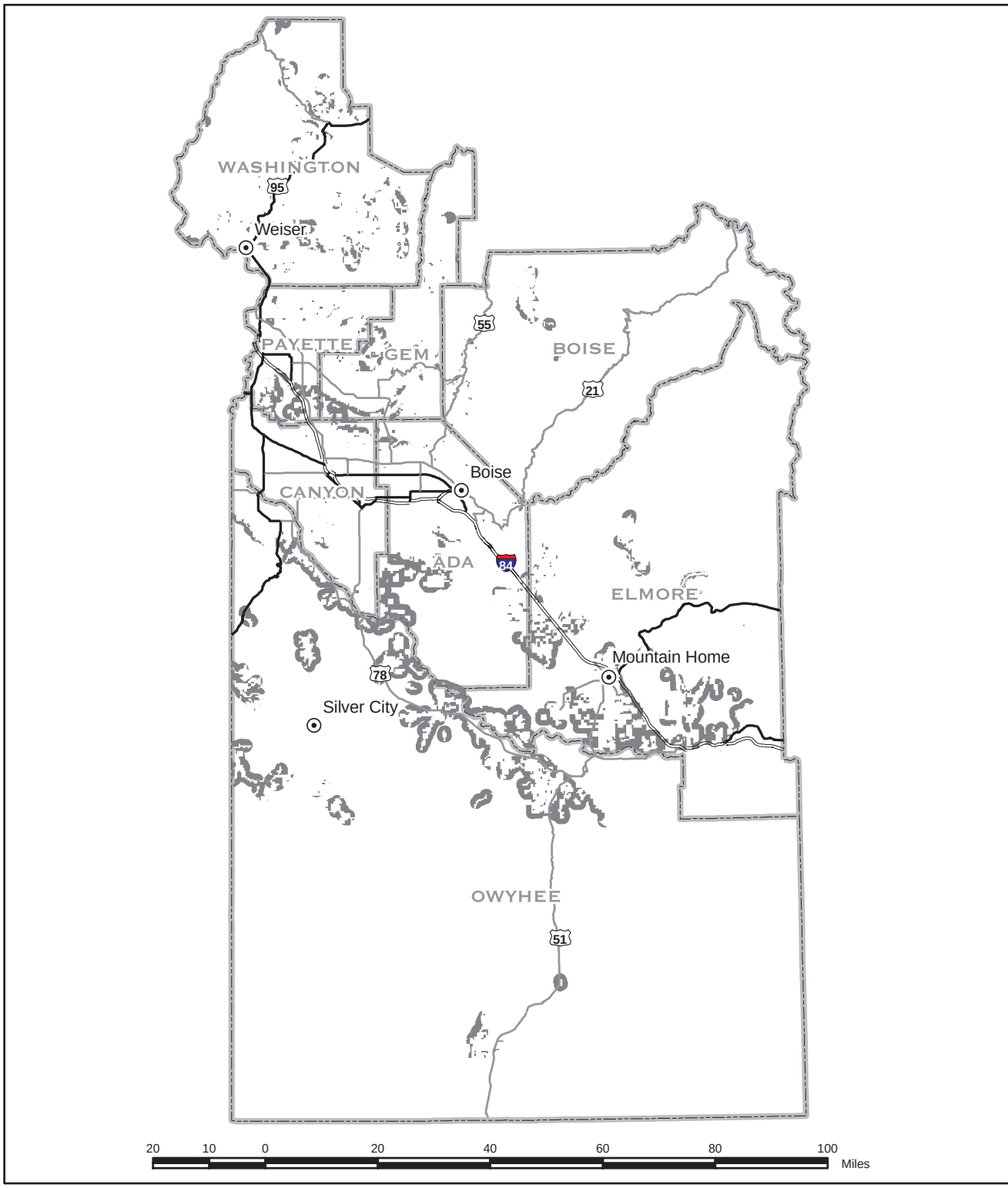
12. When using aerial bait, do not apply the bait directly to water bodies (defined as reservoirs, lakes, ponds, pools left by seasonal streams, springs, wetlands, and perennial streams and rivers), and provide a 200-foot buffer.

SPECIFIC PROCEDURES FOR GROUND APPLICATIONS (BAIT and LIQUIDS)

1. Do not apply ground bait directly to water bodies (defined as reservoirs, lakes, ponds, pools left by seasonal streams, springs, wetlands, and perennial streams and rivers). Furthermore, provide a 50-foot buffer.

2. Safety will be an integral part of each treatment project, contact Western Region Safety Officer for additional information and guidance.

2006 Potential Grasshopper Program Areas in Southwest Idaho



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February 2005

Datum: North American Datum 1983
Projection: UTM Zone 11
Units: Meters

Legend

- Program Areas
- County Boundaries
- Cities

Highways

- Interstate
- U.S.
- State

Source of Data Layers
Grasshopper Program Areas: Created through GIS Analysis of Agricultural Lands and Land Status layers
Highways: USGS 1:100,000 Digital Line Graph
Cities: Idaho BLM 1:500,000 corporate dataset
Counties: Idaho BLM 1:100,000 corporate dataset

APPENDIX 3: Correspondence Regarding Endangered Species Act

Correspondence not received at publication time.

APPENDIX 4. Protocol for Documenting Requests, Evaluations, Recommendations, Consistency Reviews, Treatments, and Monitoring of Rangeland Grasshopper and Mormon Cricket Suppression in Idaho 2006

1. Private landowners and/or public land managers who wish to request evaluations for grasshopper suppression should complete Form 1. *Request for Evaluation of Need for Suppression of Grasshoppers or Mormon Crickets in Idaho*, and fax to USDA in Boise or Twin Falls. Private landowners may also call federal land management or state offices to request the submission of this form. A case number will be assigned by USDA to each request. Requests which involve state or private land will be referred to Idaho State Department of Agriculture.

2. The USDA APHIS PPQ Grasshopper Program Staff will supervise temporary personnel across Southern Idaho. Grasshopper scouts will conduct evaluations in response to requests as well as in areas that are historically susceptible to grasshopper infestations. The grasshopper scouts will complete Form 2. *Survey Evaluation of Idaho Request #___ for Suppression of Grasshoppers or Mormon crickets.* Scouts will submit these reports to USDA in Boise or Twin Falls.

3. Experienced USDA managers will review the scouts' evaluations and determine if follow-up analysis is required. The USDA Grasshopper Coordinator will complete Form 3. *USDA APHIS PPQ Recommendation per Idaho Request #___ for Suppression of Grasshoppers or Mormon Crickets.* USDA will forward this form as well as Forms 1 and 2 to the appropriate federal land manager.

4. Land managers will receive the above-mentioned forms and will determine whether APHIS's recommendation is consistent with the program defined and analyzed in the environmental documentation. The land manager will determine if additional safeguards are required for treatments. Land managers will complete Form 4. *Federal Land Manager Consistency Review of Idaho Request #___ for Suppression of Grasshoppers or Mormon Crickets.* They will forward these forms to USDA.

5. If treatments are consistent with the description and analysis in the environmental documentation and if additional safeguards do not appear to preclude the treatment from being effective, USDA will apply or contract for application of the treatment. USDA will supervise contractors and evaluate the efficacy of treatments. USDA will keep daily treatment records and will complete Form 5. *Summary of Treatment(s) on Request #___ for Suppression of Grasshoppers or Mormon Crickets.* USDA will provide this form to the appropriate federal land manager.

6. Following treatments USDA will conduct post-treatment monitoring for program effectiveness and unintended outcomes. USDA will complete Form 6. *Post-Treatment Monitoring of Treatments on Request #___ for Suppression of Grasshoppers or Mormon Crickets.* USDA will provide this document to US Fish and Wildlife Service and to the appropriate federal land manager.

FORM 1.

*Land managers/owners complete this form and **fax** to **Boise 208-378-5794** or **Twin Falls 208-734-7863.** Or, **mail** to **USDA APHIS PPQ, 9134 W. Blackeagle Drive, Boise ID 83709.** USDA APHIS PPQ and/or Idaho State Department of Agriculture will evaluate the problem and provide recommendations or solutions.*

Party requesting control: Date of request:

Principal contact (if other than party requesting control):

Address:

Phone/cell phone/fax numbers:

County(ies) where rangeland or crop is located:

Owner(s) or land manager(s) of rangeland
or crop where control is requested : BLM ☐ Forest Service ☐ State of Idaho ☐ Private party ☐

Estimated acreage infested: _____ _____ _____ _____

Legal description (Township, Range, Sections) of area where control is requested. If legal description is not known, it can be obtained from County Assessor's Office. Please attach map(s) showing land ownership(s):

Describe nature of problem (cropland threatened, rangeland damaged, revegetation project, etc.):

Are you aware of environmentally sensitive issues such as streams or lakes, bees, or endangered species critical habitat in the area where you are requesting treatment? If so, please explain.

****

FOR USE BY PPQ/ISDA
Date and time received: By:
Case #:
Referred to: By: At date/time:

FORM 2

Will be completed by Grasshopper Field Scout and will be submitted to USDA APHIS PPQ or ISDA Manager.

Date evaluated:

Person performing evaluation:

Was complainant contacted during visit? Yes ☐ No ☐

Species of grasshopper or Mormon cricket:

Density per sq. yd.:

Predominant instar(s):
☐ 1
☐ 2
☐ 3
☐ 4
☐ 5
☐ 6
☐ 7

Description of behavior:

Approximate acres of rangeland infested
Federal:
State:
Private:

Is water present within area ☐ or bordering area ☐

Narrative report including other sensitive issues (bees, endangered species, organic farms, etc.):

Attach map showing infested areas and sensitive sites

****

FOR USE BY PPQ/ISDA
Date and time received:
Referred to: By: At date/time:

****

FORM 3

To be completed by USDA APHIS PPQ Grasshopper Coordinator upon receipt of evaluation from Field Scout. Will be forwarded to Federal Land Manager specified in request for evaluation.

I have reviewed the evaluation of complaint #_____ regarding an infestation on in _____ County, Idaho.
I recommend the following course of action:

_____
Name and title of responsible USDA APHIS PPQ or ISDA Grasshopper Coordinator

Signature_____

Date_____

****
FOR USE BY PPQ/ISDA
Date and time received: By:
Referred to: By: At date/time:
****

FORM 4

To be completed by federal land manager after review of recommendations from USDA APHIS PPQ. Fax to 208-378-5794.

The Environmental Assessment, **"Site-Specific Environmental Assessment, Rangeland _____", and associated Finding of No Significant Impact (FONSI)** have been carefully reviewed. Request for Evaluation for Control, Evaluation of Request and Recommendation for Action #_____have also been carefully reviewed. The recommendation is:

Consistent ☐

Not Consistent ☐

with control actions on rangeland specified by those documents. Any treatment will be implemented by APHIS in accordance with the operational procedures, design features, and mitigating measures described and adopted in the above-referenced documents.

In addition, the following measures are required as well as those referenced above:

Due to the following extenuating circumstances, treatment should not occur:

Signature_____

Name, title and organization of responsible official_____

Date_____

Additional forms required by land management agency should be attached.

****

FOR USE BY LAND MANAGER

Date and time:

Referred to: By:

****

FORM 5
To be completed by USDA APHIS PPQ at the time of treatment

Date(s) treatment occurred:

Contractor or employee(s) who applied treatment:

Acres treated:

Type and amount of pesticide applied:

☐ Carbaryl 5% bait _____ total lbs.
☐ Carbaryl 2% bait _____ total lbs.
☐ Dimilin 2L _____ total oz.
☐ Malathion _____ total oz.

Comments:

_____

Name of official managing control activity.

****

FOR USE BY PPQ
Date and time:
Referred to: By:

****